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UDC 613.693:616.12-008.31-057.36:358.431

Potential Use of Correlation Rythmography Method in Evaluation of Prestarting Status of Pilots

18400399 Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 3, Mar 88 pp 36-38

[Article by G.N. Grechikhin, V.G. Doroshev, and V.V. Grishchenko]

[Abstract] Based on the experience gained with athletes where the correlation rythmography (CR) method is used to evaluate cardiac rythms, this method was evaluated on pilots prior to their flying time. Pilots were examined 1-1.5 hours prior to the starting time. Out of 153 CR readings, 70.6 percent were normal. Several case studies were reported on abnormal readings which pointed out occult heart problems eventually diagnosed. Analysis of the data showed that even though CR is not capable of determining the source of extra systoles, if used as a rapid diagnostic method, it surpassed the EKG. Pilots exhibiting sinusoidal isorythmia or expressed arrythmia should not be permitted to fly. They should be given a rest period until the fatigue signs disappear and a decrease in the neuroemotional stress is obtained. Figure 1.

07813/06662

Effect of Various Exercise Regimens for Increased Antiorthostatic Resistance

18400378 Moscow TEORIYA I PRAKTIKA FIZICHESKOY KULTURY in Russian No 3, Mar 88 pp 20-22

[Article by Yu.N. Vavakin, I.P. Zhekov, and A.F. Zavadovskiy, Institute of Biomedical Problems, USSR Ministry of Health]

[Abstract] Two methods of special physical exercise designed to increase the resistance of the body to blood redistribution towards the upper segments of the body were evaluated. Twelve apparently healthy men were training 2 hours every day, 3 times a week using several types of head stands; one half of the study group did this continuously, one half with discrete breaks. Before and after the experiment the latent period of simple sensorimotor reaction to light stimulation was determined. It was shown that both methods gave a practical identical increase in resistance to blood redistribution. Thus, it is important to evenly distribute such special activity through the training period. Such exercises do not decrease physical or static endurance. They should be used in physical preparation of astronauts, pilots, and other professionals exposed to blood redistribution toward the upper torso. Figures 3; references: 13 (Russian).

07813/06662

UDC 581.1.036:634.8

Effects of Germatranol on Frost Resistance of Grape Plants

18400324c Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 2, Mar 88 (manuscript received 28 May 87) pp 509-512

[Article by M. G. Voronkov, corresponding member, USSR Academy of Sciences, T. Kh. Levit, A. F. Kirillov, V. P. Baryshok, R. A. Kozmik, A. M. Skurtul, V. M. Grozova and Z. A. Ovchinnikova, Institute of Plant Physiology and Biochemistry, Moldavian SSR Academy of Sciences, Kishinev; Irkutsk Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences]

[Abstract] Trials were conducted with germatranol hydrate—$N(CH_2CH_2O)_3GeOH \cdot H_2O$—to determine its efficacy in offering protection against frost damage of selected varieties of grape (amber muscatel, Bastardo Maharigh, Sauvignon). The plants were sprayed with 0.00001 to 0.1 percent germatranol solutions 10-12 days before flowering, during grape production, and after harvesting, with the experiments conducted in the central area of Moldavia. Monitoring of the plants for the rate of growth, including histological examination of tendrils, and frost resistance showed that germatranol exerted variable effects that were variety-specific. The growth gain in the experimental plants was less pronounced than in the control (water-sprayed) plants. However, frost resistance, physiological maturation, and starch accumulation were superior in the germatranol-treated plants. The most effective spraying conditions covered a wide dose range (0.0001 to 0.01 percent) that corresponded to 0.8 to 80 g/hectare germatranaol. Figures 2; tables 3; references 10 (Russian),.

12172/9274

UDC 632.112

Biotest for Assessing Enhancement of Plant Drought Resistance by Chemical Agents

18400327 Moscow AGROKHIMIYA in Russian No 1, Jan 88 (manuscript received 21 Oct 86) pp 111-116

[Article by N. M. Zhirmunskaya and A. A. Shapovalov, All-Union Scientific Research Institute of Chemical Agents for Plant Protection, Moscow]

[Abstract] The absence of laboratory methods for assessing drought resistance of plants led to research designed to formulate a convenient and practical method for testing the efficacy of natural and synthetic agents in enhancing drought resistance. Since only field trials provide unequivocal information on drought resistance, one of the laboratory methods that has been devised is based on exposure of Moskovskaya 35 spring wheat shoots to different concentrations (0.1 to 10 mg/liter) of the factor under study and subsequent determination of survival figures and dry weight gain (3 days under 4,000-5,000 lux illumination for 18 h/day, 24-25°C). Drying tests (35 h at 24°C) showed that two snythetic growth regulators, chloromequat chloride and cartolin-2, both enhanced the survival rate. Chloromequat chloride (10 mg/liter) was the more effective agent and exerted its action as a result of limiting dehydration, whereas the effects of cartolin-2 were less striking but repeatable and involved mechanisms other than preventing water loss. In addition, a number of natural plant growth regulators, such as kinetin, auxins, abscisic acid, and gibberellins, were also found to enhance survival of the shoots. Again, the mechanism of action involved increased water retention. These findings demonstrated that the approach taken to assessment of dry weight gain and survival of 10 day old Moskovskaya 35 spring wheat shoots may serve as a useful guide for preliminary evaluation of various agents for drought resistance enhancement. Tables 6; references 17: 11 Russian, 6 Western.

12172/9274

UDC 631.523.2:632.4

Cytoplasmic Effects in Wheat Resistance to Brown Rust

18400328 Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 32, No 3, Mar 88 (manuscript received 14 Jul 87) pp 267-269

[Article by Ye. A. Voluyevich, A. N. Palilova and V. V. Levdanskaya, Institute of Genetics and Cytology, Belorussian SSR Academy of Sciences]

[Abstract] Leaf section studies were conducted on a series of alloplasmic wheat lines to assess cytoplasmic effects in resistance to brown rust. The soft wheat lines contained Chinese Spring genome in combination with the cytoplasms of 14 Aegilops and Triticum species. The tests were conducted with a Belorussian population of the pathogen as well as with a fungal clone selected from a Georgian (USSR) population. Statistical analysis of the first-leaf shoots demonstrated marked differences between the euplasmic cultivar (Chinese Spring) and the alloplasmic cultivars in terms of resistance to brown rust, thereby demonstrating cytoplasmic effects. Most of the alloplasmic lines exceeded the euplasmic line in resistance, with the resistance being somewhat less pronounced on infection with the cloned pathogen. The latter observation was attributed to the greater virulence of the cloned pathogen. These observations on cytoplasmic contributions to host resistance represent a variable that poses an additional challenge in wheat breeding programs designed to enhance resistance to brown rust. Tables 2; references 9: 7 Russian, 2 Western.

12172/9274

Solid Phase Synthesis of Oxytocin and Its Analysis by High Performance Liquid Chromatography

18400340c Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 6, Nov-Dec 87 (manuscript received 18 Mar 87) pp 892-897

[Article by I.E. Zeltser, A.A. Antonov, A.K. Ivanov, V.P. Pakhomov and V.N. Karelskiy, All-Union Scientific Research Institute of the Technology of Blood Substitutes and Hormonal Preparations, Moscow]

[Abstract] High-performance liquid chromatography (HPLC) was used for quantitative testing of specimens of synthetic oxytocin produced by the solid-phase method (synthesis on polymer carriers). HPLC allows the influence of condensation conditions and the removal of protective groups on the yield of the end product to be determined, permitting optimization of the peptide production process. A mixture of peptides containing oxytocin was analyzed by inverse-phase HPLC, allowing peptides of similar molecular weight and structure to be separated. An ultrasphere ODS column was used with a water-acetonitrile eluent. Solid-phase synthesis on UR-95 benzhydrylamine resin manufactured in East Germany yielded a mixture of peptides containing 30.4% oxytocin. References 4: Western.

6508

Rapid Automated Synthesis of Deoxypolynucleotides

18400344f Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 14, No 2, Feb 88 (manuscript received 16 Mar 87; after revision 8 Jun 87) pp 276-278

[Article by V.P. Kumarev, L.V. Baranova, V.F. Kobzev, K.D. Kuznedelov and Yu.G. Sredin, Institute of Cytology and Genetics, Siberian Division, USSR Academy of Sciences, Novosibirsk; Special Design and Engineering Bureau for Special Electronic and Analytic Instrument Building, Siberian Division, USSR Academy of Sciences, Novosibirsk]

[Abstract] A description is presented of the synthesis of polynucleotides using 5'-O-dimethoxytritylnucleoside-3'-H-phosphonates and a hydraulic synthesizer system adapted to rapid synthesis, with one chain growth cycle requiring 70-120 seconds depending on the length of the polynucleotide synthesized. Over 160 polynucleotides with lengths of 8 to 83 monomers were synthesized, including a mouse metallothionein gene promoter (260 bp) and a promoter and leader sequence of the E. coli alkaline phosphatase gene (120 bp), by a method including detritylation with trifluoroacetic acid in dichloromethane, washing in acetonitrile without pyridine and oxidation in a single step without amines. Figures 2, references 5: 2 Russian, 3 Western.

6508

Proteins of Ricinus communis Seeds. II. Isolation and Comparative Description of the Acid Form of Ricin From Seeds of Central Asian Castor Bean Ricinus communis

18400340a Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 6, Nov-Dec 87 (manuscript received 20 Apr 87) pp 883-887

[Article by D.A. Khashimov, Kh.G. Alimov and P.Kh. Yuldashev, Order of Labor Red Banner Institute of Chemistry of Plant Substances, Uzebk Academy of Sciences, Tashkent]

[Abstract] Various authors have isolated several forms of toxic protein from the seeds of Ricinus communis, the most thoroughly studied of which has been the protein called ricin D. This article reports isolation of an acid form of ricin from the seeds of the central Asian castor bean, which the authors call ricin T. Ricin T, isolated from castor bean flour, was purified by gel filtration, separated in a 0.05 M HCl buffer, pH 8.0. It was found to differ significantly in molecular mass, isoelectric point and sedimentation rate from previously isolated ricin proteins. Ricin T has a molecular mass of 58,000 daltons, pI of 7.0-7.1, and sedimentation coefficient equal to 4.60 S. The amino acid composition and N-terminal amino acid residues of the protein are determined. Figures 3, references 26: 1 Russian, 25 Western.

6508

Proteins of Ricinus communis Seeds. III. Isolation and Description of Two Polypeptide Chains in Acid Ricin

18400340b Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 6, Nov-Dec 87 (manuscript received 11 May 87) pp 887-892

[Article by D.A. Khashimov, Kh. G. Alimov and P.Kh. Yuldashev, Order of Labor Red Banner Institute of Chemistry of Plant Substances, Uzebk Academy of Sciences, Tashkent]

[Abstract] Certain types of macromolecules in eukaryotes can penetrate through the cell membrane. The study of the toxic proteins abrin and ricin, the diphtheria toxin, the cholera toxin and a number of others have shown that these proteins consist of two subunits A and B, the latter attached to specific receptors in the membranes of sensitive cells and facilitating the penetration of the A subunit into the cytoplasm. This article studies the isolation of acid ricin subunits from the seeds of the central Asian castor bean and some of their physical and chemical properties. Ricin T was purified by gel filtration on Sephadex, ion-exchange chromatography and subsequent rechromatography. This acid form of ricin was found to consist of two polypeptide chains: an Ile-chain with molecular mass of 30 kD, plus an Ala-chain with a molecular mass of 28 kD. The isoelectric points, the N- and C-terminal amino acids of the chains and partial amino acid sequences were determined. Figures 3, references 24: 3 Russian, 21 Western.

6508

Use of Meldrum's Acid in the Synthesis of Low-Molecular-Weight Bioregulators. 3. Synthesis of Coumarin-3-Carboxylic Acids and Their Derivatives.

18400344e Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 14, No 2, Feb 88 (manuscript received 16 Feb 87; after revision 30 Jun 87) pp 236-242

[Article by Ye.A. Shirokova, G.M. Segal and I.V. Torgov, Institute of Bioorganic Chemistry imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] Coumarin-3-carboxylic acids have a hypotensive effect, act as aflatoxin antidotes and are rodenticides and anticoagualants. The authors found that coumarin-3-carboxylic acids can be easily produced by the interaction of o-hydroxybenzaldehydes with 2,2-dimethyl-1,3-dioxane-4,6-dione (Meldrum's acid) in an aqueous medium. Alkali metal hydroxides or their salts with weak acids are promoters of the process. The structure of the coumarin-3-carboxylic acids produced was confirmed by direct comparison with known specimens. References 24: 5 Russian, 19 Western.

6508

UDC 26'11'27.1'785.5'791.8'968.3:543.422.25

Acyclic Analogs of Nucleosides: Synthesis of Hydroxyalkyl Derivatives of Benzimidazole and Benzotriazole

18400326a Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 2, Feb 88 (manuscript received 16 Sep 86) pp 198-202

[Article by A. E. Yavorskiy, A. V. Stetsenko, S. G. Zavgorodniy and V. L. Florentyev, Institute of Molecular Biology, USSR Academy of Sciences, Moscow; Kiev State University imeni T. G. Shevchenko]

[Abstract] The design of conformationally mobile analogs of natural compounds has been shown to be a successful approach to the preparation of bioactive compounds, some with useful antiviral properties. Another approach relies on derivatizing nucleic acid bases. The combination of both approaches was utilized in the present study to synthesize a series of acyclic analogs of nucleosides. The basic techniques utilized condensation of trimethylsilyl derivatives of benzimidazole and benzotriazole with the desired alkylating agents in the presence of the trimethylsilyl ester of trifluoromethane sulfonic acid or of $SnCl_4$. Alternatively, direct alkylation of the benzimidazole and benzotriazole solidum salts was employed. The key products obtained in this manner included 1-(2,3-dihydroxypropyl)-, 1-(3-hydroxy-2-oxabutyl)-, 1-(3-hydroxymethyl-4-hydroxy-2-oxabutyl)-, and 1-(1,5-dihydroxy-3-oxapent-2-yl) benzimidazoles and benzotriazoles. The structures were confirmed by UV and PMR spectroscopies. Tabulated data on yields and melting points are also presented. Figures 1; tables 3; references 6: 3 Russian, 3 Western.

12172/9274

UDC 547.963.3.04'r7'854.4'857.7.04:543.422.25

Acyclic Analogs of Nucleosides: Synthesis of 1,5-Dihydroxy-3-Oxapent-2-yl Derivatives of Nucleic Acid Bases

18400326b Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 2, Feb 87 (manuscript received 23 Jul 86; in final form 5 Nov 86) pp 223-228

[Article by S. G. Zavgorodniy, Ye. V. Yefimtseva,S. N. Mikhaylov, T. L. Tsilevich, A. E. Yavorskiy and V. L. Florentyev, Institute of Molecular Biology, USSR Academy of Sciences, Moscow; Developmental Branch for Use-Ready Medicinal Preparations, Scientific Research Institute for Biological Testing of Chemical Compounds, Moscow; Kiev State University imeni T. G. Shevchenko]

[Abstract] The antiviral activity of acyclic nucleoside analogs, such as acyclovir, has stimulated interest in the synthesis of additional novel compounds in this class of agents. Consequently, a convenient method has been developed for the preparation of racemic 1,5-dihydroxy-3-oxapent-2-yl derivatives of nucleic acid bases, the hydroxyalkyl radical of which simulates the $C_{(1')}$-$O_{(4')}$-$C_{(5')}$ fragment of the ribose ring. The basic steps involved condensation of trimethylsilyl derivatives of the bases with 1,2,5-triacetoxy-3-oxapentane catalyzed by $SnCl_4$. Optically active (R)- and (S)-1-(1,5-dihydroxy-3-oxapent-2-yl)uracils, respectively, were obtained by $NaIO_4$ oxidation of α-L- and α-D-arabinopyranosyluracil and subsequent reduction with $NaBH_4$. The products were confirmed by UV and PMR spectroscopies, with the results presented in graphic and tabular forms along with yields and melting points. Figures 1; tables 2; references 8: 2 Russian, 6 Western.

12172/9274

Synthesis and Antiaggregation Activity of Prostacyclin Analogs. I. Bicyclo[3.2.0]heptane Analogs

18400344d Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 14, No 2, Feb 88 (manuscript received 17 Mar 87) pp 222-231

[Article by M.I. Lopp, A.Y. Myuraus, O.V. Parve, T.K. Vyalimyae, A.Kh. Lopp and Yu.E. Lille, Institute of Chemistry, Estonian Academy of Sciences, Tallinn; Institute of Chemical and Biological Physics, Estonian Academy of Sciences, Tallinn]

[Abstract] The antiaggregration effect of prostacyclin on thrombocytes and its simultaneous vasodilating property are of great therapeutic significance. This study explores the possibility of producing bicyclo[3.2.0]heptane analogs of prostacyclin and determines their antiaggregationn activity. Since in most

cases the antipodes of prostacyclin analogs are not antagonists, the work was performed on racemic compounds. Bicyclo[3.2.0]heptane analogs of prostacyclin are active blood thrombocyte aggregation inhibitors. Though their activity is significantly less than that of PGI_2 (10^{-3} to 10^{-4} of that of PGE_2), they may serve as models to study the influence of structural changes on the biological activity of the compound. The method developed in this study allows easy synthesis of these analogs with a broad range of structures. Figure 1, references 28: 5 Russian, 23 Western.

6508

Total Synthesis and Properties of Prostaglandins. XIV. Amide Derivatives of 3-Alpha-Tetrahydrofuranyloxy-5-Hydroxyimino -2-Beta-(3-Alpha-Tetrahydrofuranyloxy-Trans -1-Octenyl)-Cyclopentane-1-Alpha-Acetic Acid

18400344c Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 14, No 2, Feb 88 (manuscript received 2 May 87) pp 216-221

[Article by V.V. Kudryashova, K.I. Dikovskaya, A.P. Kalninsh, L.S. Kropivets, Ya.F. Freymanis, O.V. Sakhartova and I.V. Turovskiy, Institute of Organic Synthesis, Latvian Academy of Sciences, Riga]

[Abstract] In a search for new biologically active compounds, the authors synthesized a number of prostaglandins containing an amide bond in the α chain from the title compound and ω-amino acids with a linear chain of varying length (CH_2 number from 1 to 7). These compounds may also be of interest for the production of new prostacyclins. IR and ^{1}H-NMR spectral data are presented. The comparative chromatographic mobility of the homologs in a thin layer of silica gel in various systems of solvents is noted. In a number of the compounds described, a reduction in chromatographic polarity is noted beginning at the third member of the homologic series of amides probably a result of the strong intramolecular interaction of the NH group with the carbonyl ether group. Figure 1, references 12: 5 Russian, 7 Western.

6508

547.514.48

Synthesis of Tritium-Labeled Prostacyclin and Its 15-Fluoro-15-Deoxy Analog

18400324a Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 2, Mar 88 (manuscript received 1 Jul 87) pp 367-368

[Article by V. V. Bezuglov, N. K. Golovanova, V. P. Shevchenko, T. Yu. Lazurkina, N. F. Myasoyedov and L. D. Bergelson (corresponding member, USSR Academy of Sciences), Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow; All-Union Cardiological Scientific Center, Moscow]

[Abstract] A method has been developed for the synthesis of tritiated prostacyclin (PC) and its 15-fluoro-15-deoxy-PC (FDPC) analog, the latter also being capable of inhibiting thrombocyte aggregation. In view of the high lability of the PC molecule, a factor that renders impractical direct introduction of the label into the molecule, a chemical approach was utilized starting with [^{3}H]-prostaglandin $F_{2\alpha}$ (I). The three-stage process started with the methyl ester of I that was obtained either biosynthetically from arachidonic acid or by heterogenous catalytic isotope exchange. The methyl ester was then transformed to the [^{3}H]-5-iodo- derivative (II) by reaction with iodine catalyzed by sodium carbonate. Finally, the methyl ester of PC was prepared from II by deiodination, yielding 95 percent radiochemically pure tritiated PC. Conversion of the PC methyl ester to the sodium salt was accomplished by reaction with 2 equivalents of NaOH in methanol. In an analogous manner tritiated FDPC was prepared by a series of reactions starting with 15-fluoro-25-deoxy-prostaglandin $F_{2\alpha}$. In studies with rabbit thrombocytes the tritiated PC and FDPC molecules exhibited biological activities equivalent to those of the unlabeled compounds. References 6: 3 Russian, 3 Western.

12172/9274

UDC 547.458.27.057

Synthesis of Human Teratocarcinoma Neoglycoproteins with Specific Carbohydrate Components

18400323a Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 1, Mar 88 (manuscript received 9 Jun 87) pp 129-131

[Article by T. V. Zemlyanukhina, N. V. Bovin and N. E. Bayramova, All-Union Scientific Research Institute of Biotechnology, Moscow]

[Abstract] The recently described tumor antigen isolated from human teratocarcinoma PA-1 cells has been shown to possess a disaccharide fragment—Galα1-3GalNAc (I)—linked via a α-glycoside bond to either a Ser or Thr moiety of the protein component [A. Leppanen et al., Carbohydr. Res., 153(1):87-95, 1986]. Accumulation of the PA-1 antigen is evidently due to the uniqueness of the disaccharide fragment (in place of the common Galβ-3GalNAc fragment) that prevents further glycosidation, since it is a product of unusual α-galactosyltransferase activity. The uniqueness of I led to its chemical synthesis by mercury cyanide-catalyzed glycosylation of (3-trifluoroacetamidopropyl)-2-acetamido-4,6-O-benzylidene-2-deoxy-α-D-galactopyranoside by 2,3,4,6-tetra-O-benzyl-α-D- galactopyranosyl bromide, resulting in (3-trifluoroacetamidopropyl)-2-acetamido-3-O-(2,3,4, 6-tetra-0-benzyl-α-D-galactopyranosyl)-4,6-O-benzylidene-2-deoxy-α-D-galactopyranoside (II) and its β-anomer (2.3:1). Following separation of the α- and β-anomers on silica gel column chromatography, removal of protective benzylidene and benzyl groups from II led to the preparation of (3-trifluoroacetamidopropyl)-2-acetamido-3-O-(α-D-galactopyranosyl)-2-deoxy-α-D-galactopyranoside (III). The next stage involved conversion of III into the amine and then into an azideThe azide was then conjugated to bovine serum albumin and cytochrome c for the preparation of neoglycoprotein analogs of the PA-1 tumor antigen. References 8: 2 Russian, 6 Western.

12172/9274

UDC 578.084.5/577.322

Enhancement of Proton Permeability of Liposomes by Interaction of Phosphatidylcholine (PPC) with Prostaglandin E_1 (PGE1) and Its Analog (PGE-A)

18400325b Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 3, Mar 88 (manuscript received 10 Aug 87) pp 751-754

[Article by A. D. Sorokina, L. I. Boguslavskiy, T. L. Yaylenko, Ya. Freymanis, G. P. Sokolov and G. A. Deborin, Institutes of Biochemistry imeni A. N. Bakh and of Electrochemistry imeni A. N. Frumkin, USSR Academy of Sciences, Moscow; Institute of Organic Synthesis, Latvian SSR Academy of Sciences, Riga]

[Abstract] A study was conducted on the effects of PGE_1 on the proton permeability of a monolamellar liposome membrane in order to provide possible insight into the physicochemical factors underlying PG actions and effects. The room temperature experiments were conducted with monolamellar films consisting of PPC, PPC + PGE_1, and PPC + PGE-A over 0.1 M NaCl, pH 6.8. Adjustments in pH were affected by addition of 0.05 M KOH. The PGE_1 analog employed in the study consisted of the p-hydroxyphenyl ester of 11-deoxy-PGE_1. Analysis of proton flux from the liposomes yielded the following values for PPC, PPC + PGE_1, and PPC + PGE-A: 6.5 x 10^{-10}, 9.4 x 10^{-10}, and 13.997 x 10^{-10} (proton x square angstroms)/sec, respectively. These observations demonstrated that the PGE_1 analog had the most pronounced effect on the PPC membrane in increasing proton permeability. The effects of PGE_1 and, particularly, of PGE-A, were attributed to the changes induced by these agents in the PPC monolayer. Diameters of the PPC, PPC + PGE_1, and of the PPC + PGE-A liposomes were, respectively, 877, 1380, and 1733 angstroms, demonstrating that less condensed monolayers were formed on addition of the PG or its analogr. In addition, differences were also evident in the surface pressures and surface potentials, again demonstrating electrostatic, hydrophobic, and hydrational effects of PGE_1 and PGE-A. The increase in proton permeability was attributed to the presence of the carboxyl group at the end of the hydrophobic chain of the PG and its analog. The increased mobility of this group in a less compact monolayer served to enhance its role in capturing and yielding protons and, thereby, in transferring protons across the lipid layer. Figures 4; references 8: 2 Russian, 6 Western.

UDC 577.612.172:547.221

Reduction of Ischemic Heart Damage by Perfluorocarbon Modification of Cell Membranes

18400323b Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 1, Mar 88 (manuscript received 21 Dec 87) pp 228-230

[Article by S. I. Vorobyev, G. R. Ivanitskiy, corresponding member, USSR Academy of Sciences, Yu. V. Ladilov, V. V. Obraztsov, A. N. Sklifas, V. V. Ponomarchuk and N. A. Onishchenko, Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] Experimental therapeutic trials were conducted with perfluorocarbon (PFC) emulsions (Perfluoran; particle diameter of ca. 0.1 μm, 10 percent by vol. PFC, 4 percent proxanol) to assess the effects of such chemically inert agents on myocardial tolerance of ischemia. The study was conducted with chinchilla rabbits treated with 20 ml/kg of the emulsion 1-24 h prior to perfusion experiments using the Langendorf method. The effects were assessed in terms of myocardial contractility after total perfusion of the heart with Tyrode's solution until 30 min of stable activity was obtained, followed by a 30 min period of total ischemia and 40 min of reperfusion with Tyrode's solution. Throughout the experiment the heart was maintained at 36-37°C. The data showed that pretreatment of the animals with saline increases myocardial tolerance of the ischemic episode to the extent that ca. 20 percent of baseline contractile activity was recovered after reperfusion. However, pretreatment with PFC led to recovery of ca. 40-50 percent of the activity regardless of the time of administration of the emulsion. Control recovery without any form of pretreatment was approximately 15 percent. The levels of accumulation of PFC in the myocardiocyte membranes when the emulsion was administered 1, 6, 12, and 24 h before the ischemic stress were, respectively, 2.1, 4, 6, and 10.5 μg/mg protein. Since the level of protection was essentially equivalent irregardless of the time of PFC administration, it is evident that only some minimal threshold concentration has to be attained to enhance tolerance of ischemia. These observations suggest the possible use of PFC as a heart-sparing agent in heart surgery, and also demonstrate that chemical inertness does not signify biological inertness. Furthermore, these findings also underscore the use of PFC as a research tool in membrane biology. Figures 2; references 9: 6 Russian, 3 Western.

12172/9274

UDC 612.84

Approximation of Visual Pigment Absorption Spectra

18400401a Moscow SENSORNYYE SISTEMY in Russian Vol 2, No 1, Jan-Mar 88 (manuscript received 15 Jul 87) pp 5-9

[Article by V.V. Maksimov, Institute of Information Transfer Problems, USSR Academy of Science, Moscow]

[Abstract] Original expectations of representing the spectra of most visual pigments by a single curve moving up and down the frequency axis have not been fulfilled. Several approaches to this problem were reviewed and their shortcomings analyzed. An attempt was then made to develop a single, hopefully simple formula to approximate absorption spectra of visual pigments based on retinal and 3-hydroxyretinal. Such a formula would permit calculations of relative absorption spectra from

the value of λ_{max}. The principle of the the shift of the standard curve along the $\lambda^{1/4}$ scale or in the scale of relative frequencies was used. Figures 2; references: 12 (Western).

07813/06662

UDC 612.821.8

Metarhodopsin I—Metarhodopsin II Transition Kinetics During Photolysis of Rod and Cone Visual Pigments in Warm- and Cold-Blooded Animals

18400401b Moscow SENSORNYYE SISTEMY in Russian Vol 2, No 1, Jan-Mar 88 (manuscript received 10 Oct 87) pp 10-16

[Article by M.L. Firsov and V.I. Govardovskiy, Institute of Evolutionary Physiology and Biochemistry imeni I.M. Sechenov, USSR Academy of Sciences, Leningrad]

[Abstract] Among the intermediate reactions of visual pigment photolysis, the metarhodopsin I—metarhodopsin II (MI-MII) transition is of special interest because it appears to be responsible for excitation of photoreceptors. The kinetics of the MI—MII transition varies in different animal species. One of the more practical methods of studying MI—MII transition kinetics in visual pigments or rods and cones in intact cells is based on recording of early receptor potential (ERP). On this basis it was shown that, at the same temperature, the rate constant for the MI—MII transition in carp rods and in frog, lizard and pigeon cones was approximately 1-2 orders of magnitude higher than in cattle and rat rhodopsin. This may be due to the need of the visual system of cold-blooded animals to perform over a wide range of temperatures. The Arrhenius activation energy for the transition of visual pigments in cold-blooded animals was between 15 and 20 kcal/mole, about 3 times lower than in the warm-blooded animals studied. Figures 4; references 16: 2 Russian, 14 Western.

07813/06662

Cation Plasma Membrane Channels of Retinal Rod Outer Segments Activated by Cyclic GMP

18400343b Moscow BIOFIZIKA in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 11 May 86; after revision 29 Jul 86) pp 101-108

[Article by S.S. Kolesnikov, A.B. Zhaynazarov and Ye.Ye. Fesenko, Institute of Biological Physics, Pushchino (Moscow oblast)]

[Abstract] Very little is known on the chemical composition and structure of native ionic channels in plasma membranes. Classification of biological membrane ionic channels is therefore based on functional properties, including selectivity, potential dependence, kinetic characteristics and control mechanisms, plus conductivity amplitude and sensitivity to blockers. Cation channels activated by cyclic 3',5'-guanosine monophosphate (cGMP) were recently found in the plasma membrane of the outer segment of the retinal rod in vertebrates. This article describes the properties of cGMP-activated channels in cells isolated without the use of proteolytic enzymes. The properties of the channels described are quite unusual, indicating that the cGMP-activated channels are a new type of ionic channel. Currents were recorded by the patch clamp method on isolated inside-out plasma membrane specimens. The photoreceptor is found to have remarkable speed and sensitivity, capable of detecting individual light quanta. Cyclic GMP-activated channels function in vivo as light-dependent channels, bringing up the question of the extent to which the properties of these channels are functionally determined. As concerns the direct effect of cGMP, it is apparently this mechanism which can provide sufficient speed of a photoreceptor, probably impossible for the comparatively slow protein kinase link. Figures 5, references 41: 4 Russian, 37 Western.

6508

Determination of Refractive Index and Shell Thickness of Particles of Perfluorocompound-Based Blood Substitutes

18400343c Moscow BIOFIZIKA in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 29 Oct 85; after revision 26 May 86) pp 126-129

[Article by I.N. Kuznetsova, A.G. Bezrukova, V.N. Lopatin and A.V. Parshin, Leningrad Scientific Research Institute of Hematology and Blood Transfusion; Polytechnical Institute imeni M.I. Kalinin, Leningrad; Institute of Biophysics, Siberian Division, USSR Academy of Sciences, Krasnoyarsk]

[Abstract] A theoretical foundation is presented for the possibility of averaging the refractive indices of perfluoroorganic compound (PFOC) particles throughout the volume of a specimen, independent optical methods are used to determine the refractive index of the PFOC particles, and an attempt is made to estimate the thickness of the surfactant adsorption shell of the PFOC particles. An analytic expression is derived for the index of refraction of two-layer particles assuming equality of the corresponding characteristics of light scattering of two-layer and one-layer particles of the same diameter. The additive nature of the index of refraction of PFOC particles is theoretically demonstrated, allowing the shell thickness to be estimated. The results obtained can be used for development of a simple method to find the values of m_{12} (averaged index of refraction) and t (thickness of particle shell) for other particles of similar structure. Figures 4, references 16: 15 Russian, 1 Western.

6508

New Plasmid Vectors for Cloning and Expression of Genes

18400344a Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 14, No 2, Feb 88 (manuscript received 30 Mar 87) pp 149-152

[Article by A.I. Gurevich and O.V. Nekrasova, Institute of Bioorganic Chemistry imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] Gene VIII of the filamentous phage (fd, M13) has a number of features which make it quite attractive as an element for the construction of new vector systems. This gene is a strong promoter in the phage genome, transcription from which is disrupted in an effective terminator which follows gene VIII. The product of gene VIII is the basic filamentous phage coat protein (fpcp). This protein is transported into the periplasmic space of E. coli due to the presence of a signal peptide. Introduction of the structure of the fpcp gene or its elements to the vector system makes it possible to achieve high expression of a cloned gene, either directly or as a hybrid with fpcp. The authors constructed a series of pFPCP plasmids containing the entire fpcp gene or its regulatory sections for this purpose. The series of plasmids thus constructed was later used in cloning and expression of the genes of proteins and peptides containing the full fpcp gene or its regulatory elements and the unique restrictase sites included in the gene. Figures 2, references 12: 7 Russian, 5 Western.

6508

Expression of Genes in Vectors Based on Filamentous Phage Genome

18400344b Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 14, No 2, Feb 88 (manuscript received 17 Jun 87) pp 153-157

[Article by A.I. Gurevich and O.V. Nekrasova, Institute of Bioorganic Chemistry imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] The possibility of effectively producing a polypeptide product from a producing strain is determined not only by the properties of the vector, but also by the characteristics of the bacterial host cell. The authors therefore undertook a comparative study of several phage and plasmid vectors with respect to expression of a cloned leukocytic interferon gene LIFα_2 in several E. coli strains. The EcoRI/SalI fragment of the plasmid pLeIFA$_1$SD was inserted between the corresponding sites of the phages M13mp8 and M13mp9 and cloned in E. coli TGI. The cultures of E. coli produced were grown with recombinant phages M13mp8LIFA$_1$SD and M13mp9LIFA$_1$SD without an inducer, achieving an interferon yield approximately equal to that described previously for an induced system with lac promoter, about 10^6 molecules per cell. The identical level of expression observed in both hybrid phages indicates that it is independent of the direction of transcription of the LIFα_2 gene with respect to transcription of the phage vector genes. The formation of interferon in the culture with pFPCP2LIF plasmid is less effective than with the culture initiated by the phage M13mp8LIFA$_1$SD, indicating that reinitiation of translation in a system with the initiating codon UAG located near the terminating codon UGA occurs only if the translation of the preceding peptide is effective. Cultures with the plasmid pFPCP8LIF2 form a hybrid fpcp-LIFα_2 protein which retains interferon activity and has a molecular mass of about 22,000, with a yield significantly higher than the yield of interferon in the other systems studied and approaching the yield achieved with the plasmid pIF6/8. Figures 2, references 23: 10 Russian, 13 Western.

6508

UDC 616-097

Epidemiology and Prevention of Acquired Immunodeficiency Syndrome (AIDS)

18400396 Kiev VRACHEBNOYE DELO in Russian No 3, Mar 88 pp 1-5

[Article by K.M. Sinyak and L.N. Pukhteyeva, Kiev Institute for the Advanced Training of Physicians]

[Excerpt] There are still no effective preparations for the treatment of AIDS. Many drugs are being tested including interleukin-2, suramin, NRA 23, ribavirin, cyclosporin, and others. Although these agents suppress HIV reproduction in the patient's body, some of them are rapidly eliminated from the body and require frequent administration while others are toxic and cannot be administered over a long period of time. As soon as the body's saturation by the preparation is halted, the virus resumes its reproduction and its pathogenic activity.

Inactivated, live, and recombinant vaccines have been prepared for the specific prevention of AIDS and their safety and effectiveness are currently under study. Experimental investigations of those vaccines have warranted human testing. It is assumed that by 1991 vaccination will be possible for broad spectra of the population. However, inasmuch as the spread rate of this infection has been rapid, during the interim there will be thousands of new infections, illnesses, and deaths.

At the International Conference on AIDS (Washington, 1987), Professor D. Zagury reported that he has obtained a vaccine from two sources—a modified vaccinia virus (or recombinant vaccine) and a small segment of the viral envelope—protein GP 160. This vaccine does not result in infection inasmuch as it does not contain a whole virus, and GP 160 does not weaken the body's defense. Professor Zaguri (1987) believes that repeated vaccination will enhance greater immunity.

Other types of vaccines are also being developed. For example, the USSR Ministry of Health's Institute of Immunology has developed a preparation from synthetic peptides which can stimulate the production of protective antibodies. It is assumed that the vaccines which have been prepared and those that are being produced will be able to protect the body against infection and prevent illness in those persons who are in the incubation period.

The organization of a broad medical education program for the public is now extremely important. Such a program must educate the public about the ways AIDS can be contracted and make it clear that a healthy way of life will minimize the risk of infection. It is important that laboratory studies be undertaken to identify sources of infection and a complex of legal and medical measures should be carried out in order to prevent new infections.

The USSR Ministry of Health and the UkSSR Ministry of Health have already undertaken measures to protect the public effectively against such a dangerous infection and have published information pamphlets and instructions which govern all the efforts being taken against AIDS. Those documents point out the importance of broader laboratory studies to determine the prevalence of this infection and to examine all donated blood and donor blood reserves in order to exclude the possible infection of blood recipients. Most oblasts have specially assigned laboratories whose duties include the inspection of blood and blood derivatives. By the end of 1988 such laboratories will be in operation in all oblasts.

Several hundred thousand inhabitants of the republic were examined in 1987. That examination demonstrated that the infection was not widespread. A few cases of infection were identified. Naturally, a more extensive examination of the public will detect a certain additional number of infected persons, but that will be an infinitesimal number compared to the thousands and millions of persons infected by the AIDS virus abroad. The epidemic alert and comprehensive measures described will facilitate the identification of infected persons and enable them to be placed under reliable medical control. Special anonymous examination offices are being organized in all oblast centers and major cities where each citizen can obtain professional consultation and appropriate help when necessary. Still there must not be complacency. The timely broad scale measures that have been initiated to prevent AIDS and its spread must be continued in order to guarantee the success of our efforts.

06289/06662

UDC 616.127-005.8:313.13 + 312.2

Registry of Acute Myocardial Infarction: Pattern of Morbidity, Morality, and Lethality in Kaunas

18400379 Moscow KARDIOLOGIYA in Russian Vol 28, No 4, Apr 88 (manuscript received 16 Sep 87) pp 8-11

[Article by I.N. Bluzhas, R.I. Grazhulyavichene, D.P. Rastyanene, and V.P. Grinyus, Scientific Research Institute of Physiology and Pathology of Cardiovascular System imeni Z. Yanushkyavichyus, Kaunas, LiSSR]

[Abstract] The registry of acute myocardial infarction (MI) was organized in Kaunas in 1971. The data obtained made it possible to evaluate this disease, its results, the state of pre-hospital and hospital medical care, the effectiveness of preventive measures and improvements in diagnosis and therapy. The number of total MI cases increased during the 15 years, especially among young males. Among the 65-80 year old group the incidence remained the same. Initial MI was 4 times as high as repeated attacks. The number of pre-hospital deaths dropped during this period as did the hospital mortality; overall mortality dropped 12.2 percent. Mortality due to the first MI was lower than that due to subsequent MI's. Mortality increased with age and was higher among men. Figures 2; references 14: 3 Russian, 11 Western.

07813/06662

UDC 577.215;578.818

Cloning and Expression of Rous Sarcoma Virus Reverse Transcriptase in Escherichia coli

18400324b Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 2, Mar 88 (manuscript received 20 Jul 87) pp 486-489

[Article by A. A. Melnikov, Ya. Molnar, P. Khorvatt and I. Fodor, Institute of Microbial Biochemistry and Physiology, USSR Academy of Sciences, Pushchino, Moscow Oblast; Institute of Biology, Medical University, Szeged, Hungary]

[Abstract] Conventional technologies of molecular biology were utilized for the cloning of Rous sarcoma reverse transcriptase in E. coli, starting with plasmid pSRA-2 bearing a complete DNA copy of the Rous sarcoma virus genome provided by M. Dyub [sic] (USA). Isolation of the DNA, its cleavage by restriction enzymes, electrophoresis, construction of recombinant plasmids pMM6 and pMF14, and transformation of E. coli HB101 relied on the techniques described by T. Maniatis et al. [Molecular Cloning; A Laboratory Manual, Cold Spring Harbor, N. Y., 1982]. Transcription of the pol-gene was activated by addition of isopropylthiogalactoside to the culture. Induction of reverse transcriptase was accompanied by a reduction of the optical density of the culture, indicating that reverse transcriptase had an adverse impact on the physiological status of E. coli with a portion of the cells undergoing lysis. Cell extract studies showed increased polymerization of polyriboA/oligoT_{10-18} substrate after induction of reverse transcriptase activity. Such activity was abolished by the addition of 10 mM N-methylmaleimide, an inhibitor of reverse transcriptase. In addition, the reverse transcriptase was also demonstrated to synthesize a 7000 base long cDNA on total nuclear polyA^+ RNA of rat hepatocytes. Tables 2, references 11: 1 Russian, 10 Western.

12172/9274

Engineering and Psychological Problems of Effectiveness of Displays Representing Aircraft Spatial Position (Review)

18400385 Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA. SERIYA 14: PSIKHOLOGIYA in Russian No 1, Jan-Mar 88 (manuscript received 30 Jan 87) pp 3-23

[Article by I. Ye. Tsibulevskiy]

[Abstract] A review and analysis of experimental materials was presented covering the comparative effectiveness of various display systems for indicating the spatial position of airplanes. Aviohorizons of two types are presently used: one with a moving airplane indicator and one with a moving horizon. The former is more effective, allowing fewer false movements, faster estimation of the spatial position, a faster learning process and more accurate aiming at air targets. In laboratory tests an important factor is movement of the trainer cabin. It was concluded that a trainer with an immobile cabin recreates more realistic conditions that a movable cabin. Studies showed a poor effectiveness of kinalog, an experimentally designed banking indicator in aviation exercises; a second type, an indicator with frequency separation showed better results both in training and in actual flying. Two approaches were proposed to aviation displays of flight information using the principle of picture realism and the principle of agreement with the flight view. The latter was preferred by aviation psychologists and highly qualified pilots. Figures 6; references 19: 3 Russian, 16 Western.

7813/12913

Psychological Preparation for Monotonous Activity Under Desert Conditions

18400380 Moscow IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 1, Jan-Feb 88 (manuscript received 20 Nov 86) pp 55-61

[Article by V.F. Sopov, Kazakh Institute of Physical Education]

[Abstract] Psychological characteristics of individual reactions in adaptation to desert conditions were studied in order to develop methodology for psychological preparation for crossing the Karakuma desert on foot. The studies were performed in two phases: during the first stage the task was to discover differences in personalities, their reactivity to monotonous tasks and to find means of counteracting negative reactions by psychological self-control; the second phase was the actual crossing of the desert. In the preparatory phase two groups of sportsmen were identified: monotophilic (resistant to monotony) and monotophobic (nonresistant to monotony). These two groups were totally polarized in all their characteristics in two opposite directions. Candidates for the desert crossing were assigned accordingly and psychological training was carried out. During the crossing the behavior was predictive. All members who went through the special training, even the monotophobic ones, reacted adequately to monotonous conditions. Figures 2; references 19: 16 Russian, 3 Western.

07813/06662

Experimental Study of Immunostimulating Properties of Tomicide

18400345d Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 88 (manuscript received 27 Feb 87) pp 67-71

[Article by L.P. Blinkova, B.A. Yemelyanov, S.N. Kuzmin, L.G. Butova, M.S. Dzagurova and M.I. Korneyeva, Central Scientific Research Institute of Vaccines and Sera imeni I.I. Mechnikov, USSR Ministry of Health, Moscow]

[Abstract] The complex preparation tomicide, containing bacteriocin as its bactericidal base, plus a lytic agent and structural components of the cell surface of the producing microbe, has antibacterial activity against streptococcus and staphylococcus. This article presents an experimental study of the effect of tomicide on immunologic reactivity in mice, its influence on the intensity of specific antibody formation at the peak of the immune response to administration of an antigen, and the capability of tomicide to prevent a drop in the level of normal antibodies in response to experimental stress. The interferonogenic activity of tomicide was also determined. Concentrated tomicide is found to have adjuvant properties, increasing the level of antibody formation when administered in combination with the antigen. The immunostimulating effect of concentrated tomicide during stress is manifested as an increase in the level of normal antibodies to the staphylococcus antigen. Tomicide can induce the synthesis of interferon and significantly improve the overall physical endurance of animals, indicating the varied biostimulatory effect of the preparation. Figures 2, references 16: 15 Russian, 1 Western.

6508

Isotypes of Serum and Secretory O-Antibodies and Local Immunological Memory in Guinea Pigs Parenterally Immunized with Shigella Ribosomal Vaccine

18400345b Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 88 (manuscript received 30 Dec 86) pp 36-40

[Article by M.M. Lyubinskaya, Ye.V. Chernokhvostova and V.I. Levenson, Moscow Scientific Research Institute of Epidemiology and Microbiology imeni G.N. Gabrichevskiy, RSFSR Ministry of Public Health]

[Abstract] Ribosomal dysentery vaccine from Shigella sonnei, when parenterally administered, protects guinea pigs from experimental shigella keratoconjunctivitis, and protects apes from oral infection with a homologous virulent shigella culture. The combination of immunogenecity and nontoxicity with hypoallergenicity make this preparation a promising dysentery vaccine. The purposes of this study were to determine the isotype composition of the O-antibody in the lachrymal fluid of guinea pigs parenterally immunized with the S. sonne vaccine and compare it with the O-antibody composition of the serum, to determine the effect of the vaccine on the secretory IgA system of the guinea pig, and to compare the activity of the vaccine and shigella lipopolysaccharide with respect to induction of antibody formation and immunologic memory. It was found that parenteral immunization of guinea pigs with S. sonne ribosomal shigella vaccine resulted in the appearance of O-antibodies of IgA class in the lachrymal fluid and an increase in the level of IgA and IgG antibodies in the serum. The IgA antibodies in the tears are secretory, unrelated to transsudation of serum IgA antibodies. Parenteral administration of the ribosomal vaccine more intensively stimulates systemic and local antibody formation than parenteral administration of the lipopolysaccharide in a dose sufficient to maintain the O-specific component in the vaccine. The ribosomal vaccine induces both systemic immunologic memory and memory in the secretory IgA system, with an effect equal to intensive, long term enteral immunization with lipopolysaccharide. Figures 2, references 12: 5 Russian, 7 Western.

6508

Correlation Between Neutrophil Damage Index and Passive Hemagglutination Titer in Antibody Detection

18400345c Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 88 (manuscript received 15 Dec 86) pp 54-57

[Article by L. G. Belov, "Mikrob" Institute, Saratov]

[Abstract] Determination of the antibody to the capsule antigen of the plague microbe in the passive hemagglutination test is not always a satisfactory means of plague diagnosis. The immune neutrophil damage test has indicated a difference in the degree of humoral immunity in groups of persons vaccinated with the plague vaccine. The authors used the capsule antigen to provide a comparative evaluation of the reproducibility and success of determining capsule antigen antibodies in the passive hemagglutination and neutrophil damage tests in persons vaccinated against plague. Whereas the passive hemagglutination test yielded low, nondiagnostic titers, the neutrophil damage test yielded significant, positive results significantly earlier in the vaccination process. It is suggested that the passive hemagglutination test has lower sensitivity to the antibodies than the neutrophil damage test. Passive hemagglutination also yielded a significant fraction (33%) of false positive results. The neutrophil damage test reliably revealed the antibody in 95% of cases (p less than 0.06), the comparable figure for the passive hemagglutination test being 67% (p less than 0.03). This indicates that the two methods reveal functionally different antibodies to the same antigen. References 10: 9 Russian, 1 Western.

6508

Use of Endovascular Laser Irradiation of Blood in Complex Therapy of Acute Pancreatitis and Peritonitis in Experiment and Clinic

18400335 Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 140, No 2, Feb 88 (manuscript received 6 May 87) pp 34-36

[Article by A. L. Gushcha, V. A. Yudin, A. V. Fedoseyev and S. V. Tarasenko, Department of Surgical Diseases No. 2 (headed by Professor A. L. Gushcha), Ryazan Medical Institute imeni Academician I. P. Pavlov]

[Abstract] Experimental studies were performed on 81 pubescent chinchillas and 37 dogs of both sexes after creation of a model of peritonitis by injection of a 30 percent fecal suspension (1 ml/1 kg body weight) into the abdominal cavity. Acute pancreatitis was caused by the Andersen method. Clinical studies involved 30 patients whose complex therapy of pancreatic necrosis (14), gallstones (8) or peritonitis (8) included endovascular laser irradiation. Helium-neon laser irradiation and intravenous ultraviolet irradiation helped to restore homeostasis in patients with severe pancreatitis and peritonitis. Intravenous irradiation reduced pain, caused drowsiness and reduced body temperature. Ultraviolet irradiation in the period of pronounced encephalopathy reduced depression. Intravenous helium-neon laser irradiation during pancreatitis in the toxic phase reduced intoxication. The procedure stimulated erythrocyte bioenergetics, reduced the degree of hemic hypoxia and increased nonspecific immunological reactivity. References 6 (Russian).

02791

UDC 615.361.12.014.417

Evaluation of Heart Transplant Functional Status After 20-24 Hours of Biological Conservation

18400400b Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 34, No 2, Mar-Apr 88 (manuscript received 21 Jun 85) pp 51-56

[Article by E.F. Barinov, Donetsk Medical Institute imeni A.M. Gorki, UkSSR Ministry of Public Health]

[Abstract] An attempt was made to develop a safe method for routinely repeatable tests with measured load on the ventricles during autotransfusion of the heart-lung preparation (HLP) and to study the dynamics of occult cardiac insufficiency during biological conservation. Experiments were done on dogs. The experimental design used was described in detail, and it was shown that this method does detect the degree of occult cardiac insufficiency based on early, reversible myocardial metabolism disorders. Proper, timely pharmacologic correction of this disorder should significantly prolong preservation of the functional quality of the preserved heart transplant. Figures 1; references 16: 15 Russian, 1 Western.

07813/06662

Use of ELISA Method in Detection of Francisella tularensis

18400345e Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 88 (manuscript received 10 Oct 86) pp 109-112

[Article by I.S. Meshcheryakova, N.S. Umnova, K.L. Shakhanina and I.P. Pavlova, Scientific Research Institute of Epidemiology and Microbiology imeni Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] The biological method, using highly sensitive laboratory animals, cannot satisfy the requirements for rapid diagnosis of tularemia, since it takes 3 to 7 days to obtain a result. Rapid diagnosis must be done by immunofluorescence, antibody neutralization with a tularemia erythrocyte antigen diagnostic sample and passive hemagglutination with an immunoglobulin diagnostic specimen. The authors attempted to determine the possibility of using the ELISA method to detect the tularemia microbe antigen in bacterial suspensions and the organs of infected animals. Studies were performed on 27 strains of Francisella tularensis in three subspecies, isolated in various parts of the world from various sources, plus the closely related Francisella novicida. The ELISA method was found to have a sensitivity of 1 x 10^4 to 5 x 10^4 million cells/ml, one or two orders of magnitude greater than the sensitivity of the antibody neutralization, passive hemagglutination and immunofluorescence methods. ELISA is capable of detecting the tularemia pathogen in the organs of animals on the third day after infection with a minimal dose. The method is recommended for identification of isolated cultures and diagnosis of tularemia. References 8: 5 Russian, 3 Western.

6508

Legionella pneumophila Cytolysin

18400345a Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 2, Feb 88 (manuscript received 30 Dec 86) pp 4-7

[Article by Yu.F. Belyy, Yu.V. Vertiyev, I.S. Tartakovskiy, Yu.V. Yezepchuk and S.V. Prozorovskiy, Scientific Research Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] The lysis of cells in Legionnaire's disease indicates the participation of cytolysins, bacterial products which disrupt the cell membranes of target cells, in the pathogenesis of the disease. In a previous study, the authors detected for the first time the cytolytic effect of filtrates of a culture of L. pneumophilla for CHO cells. This study describes the basic physicochemical and biological properties of the purified cytolysin of L. pneumophila, strain Philadelphia I, obtained from the Centers for Disease Control, USA. The cytolytic protein obtained was homogeneous in terms of electrophoresis data and immunoprecipitation reaction. The content of carbohydrates and nucleic acids did not exceed 0.4 and 0.9 mg per 100 mg of protein, respectively. The amino acid composition of the cytolysin was determined. The substance had cytolytic activity, as well as hemorrhagic and necrotic effects. The molecular weight of the cytolysin was 37 kD. References 14: 3 Russian, 11 Western.

6508

UDC 579.842.23

Changes in Biological Properties of Plague Microbe During Its Prolonged Intracellular Reproduction

18400381 Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 50, No 2, Mar-Apr 88 (manuscript received 8 Jul 87) pp 30-33

[Article by G.I. Vasilyeva, Ye. P. Doroshenko, and A.K. Kiseleva, Scientific Antiplague Research Institute of Rostov-on-Don]

[Abstract] Changes in biological properties of the plague microbe Yersinia pestis EV were investigated during its prolonged reproduction inside peritoneal macrophages of guinea pigs and white mice, showing that such reproduction leads to increased antiphagocytic and cytopatic activity. It occurs to a greater extent in guinea pigs than in mice; the "latent" virulence of the microbe is increased 25-fold during passage in guinea pigs but does not change in mice. The immunogenicity of a subculture passed 20 times through guinea pigs intensified 70-fold. This effect was achieved faster by in vitro passage, in comparison to the in vivo method; passage through mice macrophages did not produce the same results. References 8: 7 Russian, 1 Western.

07813/06662

UDC 577.1

Silent Genes for Catechol Meta-Oxidation in Naphthalene-Biodegradation Plasmids

18400323c Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 1, Mar 88 (manuscript received 15 Dec 87) pp 237-240

[Article by A. M. Boronin, A. N. Kulakova, T. V. Tsoy, I. A. Kosheleva and V. V. Kochetkov, Institute of Microbial Biochemistry and Physiology, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] Conjugation studies were conducted which were designed to determine whether silent catechol 2,3-dioxygenase (I) genes were present in plasmids expressing catechol 1,2-dioxygenase (II) activity in Pseudomonas putida. The system under study consisted of Ps. putida BSA394, bearing plasmids pBS2, pBS217, or pBS216 expressing II but not I, cultivated on media with naphthalene, salicylate, or benzoate. Such bacteria are

incapable of growth on media containing 2-methylnaphthalene (2-MeNah) as the sole source of carbon, since metabolism of the latter depends on I. However, plating studies demonstrated that mutants capable of growing on the latter type of media appeared with a frequency of 10^{-5} to 10^{-7} and possessed an inducible I. Using such 2-MeNah$^+$ mutant clones as donors yielded recipients that acquired the 2-MeNah$^+$ phenotype and were capable of synthesizing I. These mutations, then, were localized in the pBS2, pBS216, and pBS217 plasmids, with the mutant plasmids designated pBS101, pBS102, and pBS103, respectively. These observations were interpreted to indicate that the plasmids in question possessed silent I genes that are capable of activation as a result of a single genetic event. Further confirmation of this view was provided by the fact that plasmid elimination resulted in conversion to the 2-MeNah$^-$ phenotype. Tables 2; references 15: 8 Russian, 7 Western.

12172/9274

UDC 615.373.03:616.36-002-022:578.891].076.7

Properties of HBsAg Gene Expression Product in Yeast Cells

18400342a Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 25 Nov 86) pp 29-33

[Article by M. V. Uspenskiy, N.N. Granovskiy, Yu. Ye. Simonenkov, Ye. M. Vlasikhina, G. N. Dotsenko and V. M. Zhadanov (deceased), Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] An active search is under way for an effective, safe and inexpensive vaccine against serum hepatitis. One of the attempts concentrated on microbiological synthesis of HBsAg. Experiments were more successful when Saccharomyces cerevisiae yeast were used than when the work was done with Escherichia coli. HBsAg synthesized by yeast exhibited immunogenecity and protective potential. The goal of this work was to investigate the physicochemical and biological properties of the recombinant HBsAg, which is similar in its properties to HBsAg from the plasma of a hepatitis B patient. Gel filtration may be used effectively to separate HBsAg from yeast extracts. The extract fraction containing serologically detectable HBsAg was relatively homogeneous with respect to its size, and it consisted of a high molecular complex. A specific immune response was obtained in animals immunized with HBsAg, regardless of the method of extract preparation or of thermal treatment. Figures 2; references 19: 2 Russian, 17 Western.

7813/12232

UDC 578.5

Comparative Analysis of DNA Ligase Genes of Phages T6 and T4

18400325a Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 299, No 3, Mar 88 (manuscript received 20 Nov 87) pp 737-742

[Article by A. V. Kaliman, A. A. Zimin, N. N. Nazipova, V. M. Kryukov, V. I. Tanyashin, A. S. Krayev, M. V. Mironova, K. G. Skryabin and A. A. Bayev, academician, Institute of Microbial Biochemistry and Physiology; Scientific Research Computational Center (Puschino, Moscow Oblast); Institute of Molecular Biology, USSR Academy of Sciences (Moscow)]

[Abstract] A sequencing study was conducted on the DNA ligase gene of bacteriophage T6 for the purposes of comparing it with the corresponding gene of bacteriophage T4. Employment of conventional separation techniques after digestion with the appropriate restriction enzymes led to identification of 44 differences in the respective sequences, consisting of 34 mutual transitions and 7 transversions. The resultant changes in amino acids led to a T6 DNA ligase with a MW of 55,204 daltons, versus the T4 enzyme with a MW of 55,230 daltons, as well as differences in electrochemical properties and hydrophobicity. The pI for the T6 DNA ligase was 6.2, and that of the T4 ligase was 6.1, with the hydrophobicity of the former enzyme exceeding that of the latter. The changes that were uncovered were highly conservative in nature and had no effect on in vivo activity. Thus, such studies provide a better understanding of missense mutations occurring in nature as they affect, or fail to affect, enzyme structure and function. In this regard it is germane to point out that cloned T6 DNA ligase gene has been shown to complement amber mutants in the T4 gene. Figures 3; references 8: 2 Russian, 6 Western.

12172/9274

Influence of Electromagnetic Radiation in the Radiofrequency Band (340 and 800 MHz) on Dimyristoyl Lecithin Liposomes

18400343a Moscow BIOFIZIKA in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 9 Apr 86; after revision 16 Jun 86) pp 97-100

[Article by Yu.A. Kim, B.S. Fomenko and I.G. Akoyev, Institute of Biological Physics, Pushchino (Moscow oblast)]

[Abstract] The study of the influence of electromagnetic radiation on membrane structures occupies an important place in determining the mechanisms of action of electromagnetic radiation on biological objects. This article presents the results from a study of the influence of electromagnetic radiation at 340 and 800 MHz on dimyristoyl lecithin liposomes. Experiments were performed on liposomes formed from dimyristoyl lecithin (Serva, West Germany) in 15 mM phosphate buffer (pH 7.4) with 135 mM NaCl by exposure to sound waves at 22 kHz for three minutes total in sessions of ten seconds with interruptions of 50 seconds at the temperature of melting ice. Irradiation of liposomes in an electromagnetic field for 15 minutes caused the same changes as annealing at 30°C, although the temperature did not actually rise more than 3-4 K. With 20 minutes irradiation the temperature rose by 3 K in a rectangular wave guide, 1-2 K in a flat wave guide in an electromagnetic field. Annealing of liposomes thus occurs with less total heating of the specimens, although the mechanism is not clear. Figures 3, references 8: 2 Russian, 6 Western.

6508

UDC 615.324:547.943].032.036.8

Paradoxical Relative Potency of Dermorphins on Intranasal and Intraperitoneal Administration to Rats

18400377a Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 105, No 2, Feb 88 (manuscript received 20 May 87) pp 177-179

[Article by Ye. Yu. Baturina, N. Yu. Sarycheva, V.I. Deygin, Ye. P. Yarova, A.A. Kamenskiy, and I.P. Ashmarin, Complex Laboratory of Moscow University imeni M.V. Lomonosov]

[Abstract] In 1981 demorphins were isolated from skin of Phyllomedusa frogs; currently the term demorphin refers to the heptapeptide AFGYPS-NH_2 (I). The effect of I and its analog (IdAFdAYPS-NH_2) (II) on white male rats was studied . Analgesic activity was determined by the tail flick test. Intraperitoneal administration of a 0.03 mg/kg dose of the peptides showed analgesic activity; in the range of 0.1 to 1.0 mg/kg no effect was noted and it returned again at a 5 mg/kg level. Intranasal administration showed analgesic activity only in the range of 0.001 to 0.1 mg/kg. The duration of analgesic activity was 60-90 min, the maximum being achieved 1 hr after administration. The data indicate a very complex mechanism of action of these peptides. Figures 2; references 10: 2 Russian (1 by Western author), 8 Western.

07813/06662

UDC 615.849.1.015.25].012.1

Phosphonomethylation of Anesthesin and Radioprotective Activity of Reaction Products

18400377b Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 22, No 2, Feb 88 (manuscript received 22 Sep 86) pp 191-195

[Article by V.K. Khayrullin, M.A. Vasyanina, R.Z. Musin, A.N. Pudovik, and G.G. Vatulina, Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan Branch of USSR Academy of Sciences]

[Abstract] The diethyl (I), dipropyl (II), and dibutyl (III) esters of (p-ethoxycarbonylphenylaminomethyl)phosphonic acid were obtained by phosphonomethylation of anesthesin (ethyl 4-aminobenzoate) with paraform and dialkylphosphites. The LD_{50} of these compounds was in the range of 420-760 mg/kg. Radioprotective activity of I was achieved at a dose of 140 mg/kg (50 percent survival). The activity of the compounds diminished with increasing length of the alkoxy substituent on the phosphorus atom (40 percent survival with a 253 mg/kg dose of II; 0 percent survival with a 157 mg/kg dose of III). References 12: 9 Russian, 3 Western.

07813/06662

Psychotropic Properties of Nootropic Substances With Cholinergic Component During One-time and Long-term Use

18400181a Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 50, No 5, Sep-Oct 87 (manuscript received 13 Nov 85) pp 12-15

[Article by T. A. Voronina, T. L. Garibova, Zh. A. Sopyyev and K. E. Voronin, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] The group of nootropic drugs, together with pyracetam, includes some psychoenergizing agents with a nootropic component in their activity spectrum. This is especially true of centrophenoxine (acephen, meclofenoxate) and Cleregil (deanol aceglumate, Otrun). Both drugs contain a dimethylaminoethanol fragment and produce a distinct cholinergic effect. The direct cholinomimetic effect distinguishes centrophenoxine and Cleregil from pyracetam, its analogs and pyritil. This paper describes a study of psychotropic properties of centrophenoxine and Cleregil and dynamics of their change during prolonged use and after discontinuation of them. Experiments were performed on male white rats (10) weighing 160 g at the beginning of the experiment and 280 g toward the end. Centrophenoxine (70 mg/kg) and Cleregil (150 mg/kg) were injected intraperitoneally for 1-62 days at 10-11 a.m. and, on the the day of the experiment, 40 minutes before testing. Control rats (10) received physiological solution under the same conditions. Emotional behavior of the rats was assessed by the J. Brody and W. Nauta scale, as modified by the authors, with registration of the rats' reaction to 4 forms of stressor test stimuli. A single dose of the drugs produced a distinct antiamnestic effect with no noticeable differences between the spectrum of their pharmacological activity and that of pyracetam. Prolonged use of the drugs showed quantitaive and qualitative differences in the effect of centrophenoxine, Cleregil and pyracetam. Long-term use of centrophenoxine and Cleregil intensified aggressiveness and emotional reactivity of the rats to a much higher degree than pyracetam does. The drugs reduced motor activity and willingness for contact in the rats. Discontinuation of the drugs intensified emotional reactivity and spontaneous aggressiveness of the rats. Figures 1; references 21: 7 Russian; 14 Western.

02791

Effect of 1-(Beta-alkylsulfinylethyl)silatranes on Reparative Processes of Connective Tissue

18400182b Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 9, Sep 87 (manuscript received 3 Jun 86) pp 1088-1091

[Article by L. A. Mansurova, M. S. Sorokin, N. A. Sevastyanova, L. E. Dombrovska, A. B. Skornyakova, L. I. Slutskiy and M. G. Voronkov, Irkutsk Institute of Organic Chemistry, USSR Academy of Sciences, Siberian Department; Latvian Scientific Research Institute of Traumatology and Orthopedics, Latvian SSR Ministry of Health, Riga]

[Abstract] Many 1-substituted silatranes possess high physiological activity. It has been shown that 1-(propylthiomethyl)silatrane [$PrSCH_2Si(OCH_2CH_2)_3N$] possesses pilotropic activity and sulfonium salts of the general formula $RR'S^+CH_2Si(OCH_2CH_2)_3N\ I^-$ have a pronounced anti-ulcerogenic effect. These studies were developed further by synthesizing 1-(β-alkylsulfinylethyl)silatranes $RSOCH_2CH_2Si(OCH_2CH_2)_3N$ with R=Me(I) and R=Et(II) and determining their effect on the proliferative-reparative reaction of connective tissue. The effect of the compounds was determined on a 400 square meter wound surface on 112 laboratory white rats (200 g). Controls included allowing the wound to heal spontaneously or using a liniment base placebo. Silatranes I and II were compared by using acemin ointment. Silatrane I in a liniment base was more effective in improving biological parameters of granular-fibrous tissue and in healing wounds than siltrane II. The biological activity of silatranes is determined not only by the presence of a silatrane grouping but also by the structure of the substituent in the silicon atom. This was shown by the difference in healing effect of silatranes I and II. References 17: 14 Russian; 3 Western.

02791

Synthesis and Biological Activity of Tris(2-hydroxyethyl)ammonium Salt of Phenylselenoacetic Acid

18400182a Moscow
KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 9, Sep 87 (manuscript received 7 Apr 86) pp 1081-1084

[Article by T. V. Nefedova, A. A. Kubatiyev, A. V. Martynov, S. A. Guseva, V. B. Kazimirovskaya, A. N. Mirskova, N. V. Novikova, Ye. G. Lobanova, V. D. Nepsha, L. T. Moskvitina and M. G. Voronkov, Irkutsk Institute of Organic Chemistry, USSR Academy of Sciences, Siberian Department; Department of Pharmacology, Moscow Medical Dentistry Institute imeni N. A. Semashko]

[Abstract] Great importance has been attached to study of the biological activity of organic compounds of selenium. Selenium deficiency increases susceptibility of the organism to cardiovascular, oncological and other diseases. The important biological role of selenium as an antioxidant, an antidote for some carcinogens, an active center of some enzymes and proteins and a stimulator of ubiquinone has been established. Seleno-organic compounds have been used to create bactericidal, fungicidal, radioprotective and anti-tumor drugs. This study involved synthesis and study of the biological action of the tris(2-hydroxyethyl)ammonium salt of phenylselenoacetic acid, which has been reported to be a thrombocyte aggregation inhibitor. The salt was synthesized by reaction of triethanolamine and phenylselenoacetic acid, which was produced by reacting PhSeNa with sodium monochloroacetate. The compound produced is a thrombocyte aggregation inhibitor which produces moderate antihemolytic activity and a hypocoagulation effect. Figures 2: references 14: 7 Russian; 7 Western.

02791

UDC 591.089.84:612

Investigation of Interneuronal Connections of Transplanted Embryonal Nerve Tissue With Rat Brain

18400400a Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 34, No 2, Mar-Apr 88 (manuscript received 11 Feb 87) pp 10-14

[Article by V.A. Mayskiy, N.Z. Doroshenko, V.N. Kleshchinov, and L.V. Polezhayev, Institute of General Genetics imeni N.I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] The goal of this study was to investigate interneuronal connections of nerve tissue of rat embryo brain transplanted into adult rat brain using the method of retrograde axon transport of fluorochromes. Female Wistar rats were used in these experiments. Most of the animals showed that the transplanted tissue took well and differentiated into normal nerve and glial cells. In four out of six cases effective retrograde axon transport was observed with fluorochrome accumulation in the neurons of the transplanted tissue. The number of fluorochrome-labeled neurons and their localization in transplants with the same injection site depended on the number of contacts between the transplant and the recipient brain. Figures 2; references 8: 5 Russian, 3 Western (2 by Russian authors).

07813/06662

Present and Future Status of Outpatient Polyclinic Rural Services

18400364 Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 2, Feb 88 (manuscript received 20 Oct 87) pp 3-6

[Article by P. R. Menlikulov, UzSSR Ministry of Health]

[Text] Fully meeting the rural and urban needs for all types of highly qualified medical services and a significant increase in the quality of those services constitute one of the important tasks of the health sector as established by the decisions of the 27th CPSU Congress. The successful resolution of that task is tied to improved outpatient polyclinic services, especially in the rural areas .

Further improvements in outpatient polyclinic services, which represent a basic element of the health sector, take on particular significance in connection with contemporary requirements in the Uzbek SSR whose high percentage of rural population (over 58

) shows no sign of decreasing.

A well balanced system of outpatient polyclinic services has been organized in the Uzbek SSR as a result of important measures that have been undertaken to improve rural medical services. At the beginning of 1987 the rural areas of the republic had 994 operating rural outpatient clinics, 402 section hospitals and polyclinic departments, 186 central and rayon hospitals, 702 maternity and 1,353 child care consultation offices, 107 specialized dispensaries, and 6,314 gynecology-obstetric stations. The outpatient polyclinic institutions annually receive about 83% of the patients who come there with various illnesses, and from 85.1 to 89.2% of the patients who come to those institutions in the Dzhizak, Kashka-Darya, Samarkand, Syr-Darya oblasts, and the Kara-Kalpak ASSR.

However, the existing institutions are not able to provide medical assistance to all those in need of such services. In various rayons of the republic the rural populace is often given medical assistance by secondary medical personnel, e.g., more than 40% of the rural inhabitants obtain their medical services at the gynecology-obstetric stations (GOS). Those stations also play a considerable role in carrying out comprehensive sanitation anti-epidemic measures designed to prevent and lower the rural morbidity rate for parasitic and vocational illnesses as well as the accident rate of agricultural workers, and to provide for the medical and epidemiological well-being of the populated settlements.

The principal organizational forms designed to provide the maximum possible medical assistance for the rural populace are the independent rural outpatient dispensary (IOD) and the section hospital outpatient department which serve 23.3% of all rural residents requesting a physician's services, and up to 28 to 32.1% of those requesting medical assistance in the Andizhan, Bukhara, Dzhizak, and Kashka-Darya oblasts.

At the present time more than 70 percent of the IOD's are staffed with internists, pediatricians, and stomatologists, and most of them have clinical laboratories and physiotherapy and EKG units. First-Aid department branches of the central rayon hospitals (CRH) with round-the-clock medical duty personnel have been organized in some medical establishments in the Navoi, Tashkent, Dzhizak, and Kashka-Darya oblasts.

The polyclinic divisions of the CRH's represent the basic unit for rendering outpatient services to rural residents. In 1986 47.9 percent of all outpatient services were rendered at those divisions. That figure was 50.0 to 58.5 percent in the Andizhan and Fergan oblasts and the Kara-Kalpak ASSR. In connection with the expansion of the CRH's, the average number of hospital beds in 1986 was 383 (372 in 1985), and medical services in most of their polyclinic divisions are offered in 24 to 26 areas of specialization. The polyclinic divisions of the central and rayon hospitals currently have 481 X-ray and 125 fluorographic machines, 197 EKG functional research laboratories, and 185 biochemical clinical laboratories which permit a more thorough examination of patients.

The polyclinic divisions of the oblast and republic hospitals, the medical VUZ and scientific research institute clinics, and the specialized dispensaries play a considerable role in rendering outpatient services (primarily consultative) to the rural populace. In 1986 0.7 percent of the rural population went to the consultative polyclinics of the oblast and republic hospitals (which constituted 54.6 percent of the total number of visits to these polyclinics) and about four percent of the population went to the specialized dispensaries.

The total medical services rendered to the rural population by urban treatment and prophylactic institutions expanded considerably. More than two percent of the rural population was attended by those institutions. The corresponding figures for the Namangan, Fergan, and Dzhizak oblasts and the city of Tashkent were 4.7%, 3.2%, 3.1%, and 3.6%, respectively.

An important factor in the improvement of medical services for sovkhoz workers is the creation of the so-called intersovkhoz (sovkhoz) medical-sanitation units which operate on the shop principle of medical services for industrial enterprise workers as applicable to the specific characteristics of agricultural production. The first such medical-sanitation units to be organized in the republic were those created in the Syr-Darya Oblast (the Moskva Agroindustrial Association of Akaltynskiy Rayon) and in the Namangan Oblast (the sovkhoz imeni Lenin of Papskiy Rayon).

The agroindustrial associations have allocated more than 300,000 rubles for these medical-sanitation units for the acquisition of equipment, apparatus, reconstruction, and capital repairs. All of the IOD's within the medical-sanitation service area have been converted into medical public health stations, gynecology-obstetric stations, and paramedical stations at which all of the personnel retain the privileges of the regular medical personnel at rural medical stations.

Mobile medical units are playing a definitive role in providing outpatient polyclinic services for rural residents, particularly in the large rayons. The republic currently has 65 X-ray and fluorographic and 41 stomatological machines and 72 clinical diagnostic laboratories. All central rayon hospitals and oblast therapeutic-prophylactic institutions now have mobile outpatient units comprising three to four physicians (internist, pediatrician, obstetrician-gynecologist, surgeon, ophthalmologist, etc.). In some rayons of the Navoi and Dzhizak oblasts and the Kara-Kalpak ASSR the mobile out-patient units also have special vehicles.

The Finnish bus manufactured by the Skania firm is being used very successfully at the Republic Ophthalmological Hospital.

Within a period of 10 days alone more than 900 persons were given prophylactic examinations in the cattle breeding areas, and surgical procedures for various eye diseases were performed on 45 patients in the bus's operating unit.

As has been the case in the past, the main future problem of the health sector in rural areas is the provision of outpatient, and particularly specialized medical services for the rural population. The extent and quality of that service depends on a host of factors such as specific working and living conditions, the economic status and quality of life, geographic and climatic conditions, the distribution of rural residents, population density, distances required to obtain medical services, the presence of hard-surface roads, and means of communication and transportation .

One of the ways of overcoming these difficulties and making medical services available to the rural population is an intensive development of a IOD network whereby there would be one such dispensary per 4,000 to 5,000 residents, and one per 1,000 residents in the cattle breeding zones, mountainous, and semi-desert areas. Each medical dispensary must be provided with an internist, pediatrician, and stomatologist and should have a clinical laboratory and EKG and physiotherapy units.

Polyclinics equipped with diagnostic and therapeutic equipment and staffed with internists, pediatricians, obstetrician-gynecologists, stomatologists, surgeons, and where possible, ophthalmologists, otorhinolaryngologists, neuropathologists, etc., should be attached to the major rural section hospitals (more than 75 hospital beds, and in those with more than 50 beds in the cattle breeding zones). Each such polyclinic must have a round-the-clock emergency station (which must be provided with a vehicle). It would be advisable to offer supplemental pay to physicians from the polyclinic and section hospital for emergency service calls. The development of outpatient units which function as a regular medical section holds greater promise. The rural medical section must approximate as close as possible the substance and form of an urban unit and allow for the rendering of services on the principle of a "family" physician (internist, pediatrician).

The planning of the material and technical base of the IOD's must be based on the specific socioeconomic and geographic characteristics of the various regions. In high population density areas the out-patient unit should be able to handle 140 to 190 visits per shift, and no more than 100 visits per shift in the lower population density and cattle breeding areas.

The number of obstetric-gynecological stations should not be increased in connection with the intensive development of the IOD's. In the immediate years ahead the gynecology-obstetric unit activity should be concentrated on the performance of prophylactic measures and should be more actively engaged in annual preventive public examinations and measures designed for patient recovery.

As was the case in the past, the polyclinic divisions of the central rayon hospitals and the other therapeutic-prophylactic institutions of the rayon center will have the bear the main burden of rendering specialized and consultative out-patient polyclinical services.

In the rayons of the Fergan Valley oblasts and in the Tashkent, Khorezm, and Samarkand oblasts where the central rayon hospital capacity must be brought up to at least 700 beds, plans must be made to offer polyclinic services in 24 to 28 areas of specialization, and in 18 to 22 specialized areas in regions with a broadly served area and widely dispersed population in which the central rayon hospital does not exceed 400 beds.

In order to make fuller use of the material and technical base, improve the quality of diagnostics, and assign personnel in a rational manner, the diagnostic offices and clinical laboratories should be concentrated at the central rayon hospital pursuant to the organization of a rayon clinical-diagnostic division. Attention must be given to the development of a network of inter-rayon specialized institutions (departments) in ophthalmology, otorhinolaryngology, traumatology, urology, neurology, and dermatoneurology. Such departments should have a 400 minimum bed capacity.

The scope of outpatient polyclinic services offered to the rural populace by the oblast (republic) hospital and other oblast specialized therapeutic and prop hylactic institutions will be expanded. Those expanded services must be of a consultative nature and should be offered primarily in the "narrow" fields of specialization. The tasks confronting the oblast (republic) hospitals will be resolved successfully by the organization of oblast and republic consultative-diagnostic centers.

As before, mobile medical services will continue to play an important role in providing medical assistance to residents of remote settlements and the cattle breeding zones. Each central rayon hospital and every oblast (republic) hospital must organize mobile medical dispensaries which, in addition to physicians, should include sanitation and epidemiological station personnel and pharmacies. Mobile X-ray, fluorographic, and stomatological machines along with clinical-diagnostic laboratories should be concentrated in such a hospital or oblast specialized medical institution, and such equipment should be sent out to the rayons at previously arranged time schedules. The simultaneous dispatch of the mobile medical dispensaries, the X-ray and fluorographic and stomatological apparatus, and the clinical-diagnostic laboratories would yield the greatest effect.

The status and quality of medical services for the rural population must correspond to the socioeconomic transformations taking place in today's rural areas which make it mandatory that constant efforts must be made to find and introduce effective forms and methods of medical facilities operations in the rural areas.

6289

Interview with USSR Health Minister Chazov

18400366 Moscow CHELOVEK I ZAKON in Russian No 2, Feb 88 pp 22-26

[Interview with Academician Yevgeniy Ivanovich Chazov, USSR Minister of Health: "Guarding Health"; first two paragraphs are introductory paragraphs that appear in boldface in source]

[Excerpts] **Health—something that worries every individual. The principles of the health legislation of the USSR and the union republics begin with these words: "Protecting the health of the people is one of the most important tasks of the Soviet state." Nearly all branches of Soviet law contain norms that are directed at protecting this priceless national property.**

The Central Committee of the CPSU and the USSR Council of Ministers have approved the "Basic Guidelines for the Development of Public Health Protection and for the Restructuring of Health Care in the USSR During the 12th Five-year Plan and up to the Year 2000." Our correspondent met with Academician Yevgeniy Ivanovich Chazov, USSR health minister, and asked him to answer a number of questions.

Q: It is quite obvious, Yevgeniy Ivanovich, that no small amount of space in the Basic Guidelines is devoted to issues of a legal nature. They directly address the need for introducing specific legal norms and a whole array of penalties for various kinds of infringement of the law that are associated with the protection of people's health.

A: That's right. You know, we feel that protecting the health of the people is such a serious issue, such an important matter, that it should be included in the framework of specific laws and specific norms. Take the sanitary well-being of the country. It, after all, is the most important issue, because averting illness—prevention—is a priority for protecting the health of our people. It is a credo that was established back in the first days of the Soviet state and our health care system. And the ecology and sanitary conditions play a very important part in prevention. A particularly pointed issue involves the regulation of relationships like the one between public health and the interests of certain enterprises. And it's important now, when restructuring is going on, when labor collectives are beginning to assess the existence of enterprises. For that reason, there must be strict norms to which enterprises must adhere, and there can be no anarchy associated with it.

The role of the Ministry of Health in the carrying out environmental protection measures is increasing substantially. The USSR Ministry of Health must lead the battle against environmental pollution and disruption of the ecological balance, considering it one of the fundamental directions to be taken by preventive work. State health inspection units have been instructed to be firmer in their use of legal leverage to bring about strict observance of the legislation aimed at protecting the sanitary conditions of the soil, water, and air. Health inspection is more active in seeing to it that enterprises, institutions, and organizations observe the health-and-hygiene and anti-epidemic rules and regulations.

Unfortunately, all these standards right now are rather uncoordinated, scattered about in many documents. We don't even have a law on the sanitation service. That's why the question is coming up on the creation of the Health Code, a digest of regulations on the sanitary conditions of the country. We need to codify in a single act regulations and procedures for observing health and hygiene norms that are operative throughout our entire state and are mandatory for all enterprises, institutions, organizations, officials, and USSR citizens. Moreover, the procurator's office and the health inspection must take exhaustive measures in all identified instances of infringement of health-and-hygiene and antiepidemic rules and regulations and must employ legal means more

vigorously to faithfully protect the health and life of Soviet citizens, instituting material, disciplinary, administrative, or criminal proceedings against the guilty parties.

A complex of resolutions concerning the psychiatric service in our country is being examined right now and is slated to be adopted in the near future. This service is also being included in the framework of specific norms, because we must protect the individual. On the one hand, we must protect society, which can suffer from the actions of certain mentally ill individuals; and on the other hand, we must protect the individual from potential, improper actions of certain medical organizations. This also requires a digest of regulations.

Q: The Basic Guidelines devote much attention to the growth of a network of polyclinics, hospitals, and other medical institutions. Many of our readers are also asking, Will fee-based treatment be expanded in the future?

A: When the draft of the Basic Guidelines was being considered, there was a great deal of discussion on this topic in labor collectives and in print, and we also received letters from individual citizens. But no matter what the arguments that surround this issue, we still feel that the grandest achievement of the Great October Socialist Revolution is free medical care. It is a great social achievement. It is the basis of Soviet medicine and is, and will continue to be, effective. And it will always be fundamental to the protection of the health of our people.

Fee-based, cost-accounting polyclinics constitute less than one percent of the total volume of medical care and medical services rendered.

But we feel that, with the growth of democratization in our country, every individual has the right to receive not only that which the Ministry of Health or the state, as they say, gives him. He can rightfully consult with a physician other than the one recommended by the polyclinic or hospital. The patient may have all kinds of doubts! Let him pay his money and receive medical care at fee-based institutions. For that very purpose, a fee-based homeopathic hospital was opened quite recently in Moscow. But although this kind of care will grow in our country, it will nevertheless constitute only a small fraction of the total medical care given.

Q: The expression "house doctor" is found in the Basic Guidelines. What does it mean?

A: When we speak of the priorities of our medical service, we put the pre-hospital stage at the top today. And we consider the district physician to be the key figure. But look at what he is now. In essence, the district physician has become a dispatcher who sends patients who are registered with him to various specialists. No, I am not saying that he has "fallen" in terms of his skills. But he is no longer the physician who serves his patients, in the best sense of the word, or who serves their health.

So just what is a "house physician," or a "family physician"? It's a general-practice physician who knows well the people in the district to which he is assigned. Understandably, it's no easy matter: according to our norms, after all, a physician's district has 1,500 individuals, which is roughly 500 families. And we want to make it so that he knows a little more about those people. So that he's not still learning about them when he should be treating them, and well before that, so that he's preventing disease. He must be a broad specialist and must be able to give first aid. It's another matter if a case is so difficult that he can't sort things out himself—then he sends the patient to a specialist. All in all, we had this type of physician before the war, and now we're trying to reestablish him. This is a very complex issue, and dealing with it will require changing the training of the physician, not to mention his psychology.

Q: There are readers, Yevgeniy Ivanovich, who suggest eliminating departmental hospitals and polyclinics, which, from their point of view, violate the principles of equal rights and democratization in our country.

A: That issue was also examined quite vigorously when the draft of the Basic Guidelines was being considered. But we are against eliminating these departmental medical institutions. It's another matter that they should under the permanent control of health-care units. We feel that you shouldn't throw the baby out with the bath water. Rather, what exists should be brought up to par. That's our principle.

Take the ZIL automobile plant. It has an excellent hospital, health and medical unit, and sanatorium-clinic. Or take the hospital for the oil workers in Baku. It's the biggest hospital in the city. Why would we want to get rid of all that and destroy it? We even have city plants in which the plant provides the entire population with medical care. What's more, the Basic Guidelines provide that every plant with more than 5,000 workers must have a health and medical unit and its own polyclinic and that every plant with more than 8,000 must also have a hospital.

No, departmental medical facilities must be kept. However, we feel that these departmental polyclinics must treat not only "their own," who work at the enterprise or in the institution, but also people in the territorial district. That's why local soviets of people's deputies have been given the right to make decisions concerning the treatment given in departmental hospitals and polyclinics to the contingent that lives in those areas.

13227

UDC 616.89-008.44.1.13-06:616.89-092

Dynamics of Alcoholic Psychoses in Recent Years Under Conditions of Intense Effort to Control Drunkenness and Alcoholism

18400382 Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian Vol 88, No 4, Apr 88 (manuscript received 21 Oct 86) pp 105-107

[Article by M. I. Vorobyev and A. V. Khudyakov, Department of Psychiatry (headed by Professor M. I. Vorobyev), Ivanovsk Medical Institute]

[Abstract] The dynamics of alcoholic psychoses was studied using hospital admissions cases from the July-December 1984 and the July-December 1985 periods. The hospital was the only treatment facility in the selected industrial city, and therefore the data were representative of the situation existing during the study periods. Analysis showed that in the 1985 period, when an intensified program of antialcoholism was carried out in the city, the number of alcoholics dropped by ⅓ in comparison to 1984. Patients retaining a social and clinically positive profile were responsible for this decrease. The number of individuals with a long history of alcoholism, those with advanced stages, with other psychoses, organic cerebral damage and socially maladjusted individuals increased substantially. It was therefore concluded that future programs should be targeted at these populations. Also, the therapeutic interventions should last an adequate period and be very thorough. References 9: 7 Russian, 2 Western.

7813/12913

Management of Public Health and Means of Its Restructuring in Rostov Oblast

18400346 Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 88 (manuscript received 31 Mar 87) pp 21-23

[Article by O.Ye. Chernetskiy, I.M. Chebotarev and V.A. Frolov, Rostov Medical Institute, Rostov Oblast Public Health Department]

[Abstract] At a certain stage in the development of public health services, the old organizational structure can no longer cope with the new tasks and must therefore be improved. Analysis of the existing management system in Rostov oblast has shown that administrative connections are broadest and most stable among the oblast public health department—city and rayon public health departments—central rayon hospitals—therapeutic-prophylactic institutions. The existing management system includes 4 or 5 intermediate stages, which increases the time required to transmit management instructions, reduces timeliness, spreads authority among management branches, and weakens the authority of chief physicians. The number of individual stages must therefore be reduced. The automated management system created in the oblast public health department computer center has had little effect, since the introduction of automated management systems to poorly organized management processes cannot be effective. A transition to concentration and integration of services would make radical changes to the organizational structure of management of the public health system, requiring clarification of management functions for various elements of the system, delineation of rights and responsibilities and development of qualitative characteristics to evaluate the functioning of the system. The time has come to develop a standardized principle for processing the information streams in the oblast public health system, creating models of individual levels, which will then subsequently be bought together to create a unified organizational and information system for the oblast. The economic effectiveness of the combined management system can be evaluated by the increase in volume of medical services provided, the increase in effectiveness of management labor, the decrease in the number of management personnel required and the management budget, and the improvement in the quality of medical services provided to the population.

6508

UDC 616-082:681.31

Computerized Medical Information Systems in General Hospitals

18400350 Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 88 (manuscript received 15 Jun 87) pp 27-33

[Article by D. Shcherbatkin, R. A. Elchiyan and I. V. Yemelin]

[Abstract] Advances in medical technology, increasing specialization, and greater health awareness are placing an ever increasing information burden on hospitals that may have an adverse impact on timely health care delivery. This is particularly true of general hospitals where the increase in case histories and clinical protocols has created a paperwork burden approaching catastrophic proportions. The introduction of computers into the hospital setting offers great promise in alleviating the situation both from the administrative and clinical viewpoints. On the one hand, administrative data can be processed, stored, and retrieved in an efficient manner, and on the other clinical data banks constitute an invaluable information resource for the clinician and facilitate interdisciplinary and/or interdepartmental communication. It has been estimated that for efficient utilization of computer technology in the hospitals one terminal should be available for 3-30 patient beds. Presently, the institutions with the best developed automated medical informations systems in the USSR are the Moscow City Hospital imeni S. P.

Botkin, the Main Military Hospital imeni N. N. Burdenko, the Institute of Cardiovascular Surgery imeni N. A. Bakulev, and the Central Clinical Hospital. The implementation of such new technology entails careful evaluation of the social, financial, psychological, and moral factors to insure that individual rights to privacy, employment, and service are not inadvertently jeopardized. In addition, estimated useful lifetimes of hardware and software have also to be factored in to avoid overly optimistic outlooks and simplistic approaches. References 9: 4 Russian, 5 Western.

12172/9274

UDC 616-084.3:616-07:[519.24:681.31]

Microcomputer-Based KASMON Medical Registry System

18400348a Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, Jan 88 (manuscript received 14 Apr 87) pp 32-36

[Article by V. V. Kanep, academician, USSR Academy of Medical Sciences, G. S. Popova, S. L. Solomonov, candidate of technical sciences, L. F. Yablonskaya and M. B. Magid, Riga Medical Institute]

[Abstract] The Latvian SSR Ministry of Health has developed and implemented a comprehensive computerized system for mass screening (KASMON) to facilitate monitoring and diagnosis. KASMON utilizes unsophisticated objective examinations and responses to 67 anamnestic questions in conjunction with diagnostic algorithms to diagnose 16 disorders noted for high morbidity in the population. On the basis of the pathology that has been uncovered, KASMON provides indications for more detailed clinical assessment. One physician, assisted by 9 medical assistants (including a computer specialist), can process 15,000 individuals per year. This approach releases specialists from mundane tasks in the mass screening program for concentration on cases requiring their expertise. The effectiveness of KASMON has withstood a 3-year trial (1984-1986) demonstrating its efficiency. For example, in 1985 the recorded cases of morbidity increased by 17.6 percent in comparison with 1983, primary diagnoses of diseases increased by 26 percent, and the number of patients under ambulatory care by 15.1 percent. The use of KASMON at polyclinics has been shown to greatly facilitate the work of physicians and enhance the efficiency with which the mass screening program operates, and can be expected to find wide application across the USSR. References 5 (Russian)

12172/9274 .

UDC 378.661:616-084

Teaching Preventive Medicine at Medical Institutes

18400348b Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, Jan 88 (manuscript received 16 Feb 87) pp 41-44

[Article by V. A. Minyayev, I. V. Polyakov and I. Ye. Golovchiner, First Leningrad Medical Institute imeni I. P. Pavlov]

[Abstract] With the emphasis on preventive health care in the USSR, the teaching of preventive medicine at medical institutes has acquired new importance. The purpose of such training programs is to instill proper appreciation of the importance of preventive measures in health care, and to provide the practical and theoretical experience for successful practice. The absence of a unified training program has led to duplication of effort and waste of time, shortcomings that have seriously detracted from the effectiveness of training programs in preventive medicine. A new approach that has been developed which consists of four phases that have been designed to impart the level of knowledge that is absolutely indispensable. The first phase encompasses the 3rd course of studies (5th-6th semesters) and deals with the basics of preventive medicine at ambulatory polyclinics. The second phase (4th-5th course, 7th-10th semesters) covers mass screening at polyclinics and OBGY and pediatric services, as well as the importance of mass screening in the practice of the district physician. The third phase consists of active practice during the 4th-5th semesters during the summer session, and the fourth phase (6th course, 11th-12th semester) involves independent work in mass screening. Finally, additional measures need to be taken to insure that the lectures and other aspects of the program are at a level that meets the challenge of Soviet medical education.

12172/9274

UDC 616-036.86"742":313.13]:66

Temporary Occupational Disability Statistics in 10th and 11th Five-Year Plans

18400351a Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 4, Apr 88 (manuscript received 1 Dec 86) pp 33-35

[Article by M. S. Asayenok, docent, Minsk Radiotechnical Institute]

[Abstract] A statistical analysis was conducted on temporary occupational disability in Belorussia in the 10th and 11th Five-Year pLans (1974-1983) in order to assess the effectiveness of capital expenditures on occupational health improvement. The study revealed that between 1974-1976 and 1981-1983 overall loss of workdays due

to occupational illnesses decreased by 11.3 percent. The reduction was particularly due to the reduction in dermatologic cases (-38.5 percent), peripheral nerve disorders (-32.3 percent), and common colds (-20.6 percent). However, disability due to cardiovascular problems showed a 9.1 percent increase, as did musculoskeletal disorders (+12.9 percent). The latter two parameters indicated the need for additional care and attention in monitoring factors responsible for morbidity of those systems. The obvious indications are that work regimens must be improved to alleviate stress and provide for rest and recreation periods in the industrial setting, and ergonomic studies must be conducted to further reduce physical demands on the musculoskeletal system. Tables 2: references 6 (Russian).

12172/9274

UDC 614.253:616-036.86"742"

Staff Morbidity With Temporary Incapacity at Poltava Medical Stomatological Institute

18400351b Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 4, Apr 88 (manuscript received 2 Feb 87) pp 36-38

[Article by Ye. V. Bazhan, candidate of medical sciences, Poltava Medical Stomatological Institute]

[Abstract] An analysis was conducted on the morbidity patterns accompanied by temporary incapacity of the staff of the Poltava Medical Stomatological Institute for the years 1982-1986. In comparison with other occupational groups, the morbidity of the staff over the period in question was found to be high. Thus, in 1982 the number of cases and days of incapacity per 100 staff members stood at 57.5 cases and 830.0 days. The corresponding figures for the following four years were as follows: 1983—63.1 cases and 909.8 days, 1984—71.2 cases and 1099.5 days, 1985—71.0 cases and 925.9 days, and 1986—65.2 cases and 791.9 days. The morbidity increased with age and was always higher for the female contingent, with 60 percent of all lost workdays attributed to staff over 40 years of age. Respiratory disorders were pre-eminent in the morbidity pattern at the institute, followed by cardiovascular, digestive and gynecologic problems. Further improvements in the health status of the staff may be expected with implementation of regular fitness programs, a regular schedule of medical examinations, and higher awareness of good health habits.

12172/9274

UDC 614.27(470.311)

Enhancement of Ethical Drug Availability

18400349a Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 2, Feb 88 pp 31-33

[Article by A. D. Apazov and R. S. Skulkova]

[Abstract] The Soviet health program for the 12th Five-Year Plan and thereafter calls for a marked improvement in the availability of pharmaceutical supplies, especially ethical drugs. To assess the needs of the Soviet people an evaluation was conducted on 798 letters from medical and pharmaceutical personnel, as well as ordinary citizens, received at the USSR Ministry of Health which touched upon this aspect of Soviet health care. This particular sample demonstrated that the primary concern dealt with the shortage of drugs, a problem addressed by 23.5 percent of the correspondents. The need for more appropriate dosage forms was the second problem most often addressed, accounting for 14.3 percent of the letters and representing the medical and pharmaceutical constituencies. Competence of pharmaceutical personnel was the chief concern of 11.5 percent of the correspondents, with the remaining letters dealing with the need for more efficient pharmaceutical services, better information resources and patient education, financing of pharmacies, and reorganization of the entire drug supply system.

12172/9174

UDC 616-07-035.7-02:378.661

Enhancement of Professional Competence of Physicians

18400349b Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 2, Feb 88 (manuscript received 20 Jan 87) pp 52-55

[Article by L. S. Bondarev, professor, and Yu. Ya. Babayev, docent, Donetsk Medical Institute]

[Abstract] An analysis was conducted on factors contributing to the poor clinical performance of physicians, with a view toward introducing corrective measures in the education process to enhance clinical acumen. One of the key factors was identified as late diagnosis or misdiagnosis. In 60.1 percent of such cases the diagnostic error was clearly due to incomplete examination of the patient, while in another 39.9 percent poor clinical performance was attributable to errors in logic in the diagnostic decision-making process. These observations led to corrective measures being taken in the training program at the Donetsk Medical Institute, relying on extensive teaching by example, encouragement of self-study, and detailed analysis of clinical cases. The purpose is to instill rigorous diagnostic algorithms in the student. The most promising students, in addition, are encouraged to embark on research projects under faculty supervision to further promote investigative habits. References 5 (Russian).

12172/9274

UDC 614.2:615.47

Joint Meeting of Collegia of USSR Ministries of Instrument Production and of Health

18400349c Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 2, Feb 88 pp 77-79

[Article by V. N. Pichugin, candidate of medical sciences]

[Abstract] A joint meeting was held of the collegia of the USSR Ministries of Health and of Instrument Production to address the pervasive problem of shortcomings in

medical instrumentation and equipment, particularly as this applies to the 12th Five-Year Plan the period thereafter to the year 2000. The key complaints from the medical community deal with the poor quality and unreliability of the instruments and equipment being supplied by the Soviet manufacturers, as well as shortages and lack of timeliness. Very little of the effort produces state-of-the-art instrumentation that is equivalent to that prevalent in the West, and this of itself should be biggest stimulus to perestroika in the Soviet medical instrumentation industry. Despite the fact that the USSR Ministry of Instrument Production is currently supplying 5,500 various products valued at 650 million rubles, only 61 percent of the demand experienced by the USSR Ministry of Health was met in 1987. To resolve these problems in a timely manner the production lines must be computerized with concomitant reduction of manual labor, quality standards must be raised, better qualified scientists and engineers recruited into instrumentation engineering, and the quality of materials received by the manufacturing arm of the USSR Ministry of Instrument Production significantly improved.

12172/9274

UDC 616.419-001.29-085.31:546.34]-036.8:616.419-003.971

Effect of Lithium Carbonate on Hematopoietic Stem Cells (CFU_s) in Acute Radiation Injury

18400383 Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 1, Jan-Feb 88 (manuscript received 17 Feb 87) pp 41-43

[Article by B. B. Moroz, Yu. B. Deshevoy, O. A. Tsybanev and A. I. Adyushkin, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] The goal of this work was to investigate the effect of lithium carbonate on the process of regeneration of CFU_s in bone marrow and to observe the direction of their differentiation after acute radiation exposure to 6 Gy ($ZD_{40-50/30}$). Experiments were performed on CBA x C_{57}BL hybrid mice. It was shown that administration of lithium carbonate at a dose of 50 mg/kg stimulated postradiation regeneration of CFU_s as early as the 7th postradiation day. The process was uniform without affecting the distribution of the blood forming colonies, i.e. without affecting the differentiation process. References: 8 (Western).

7813/12913

UDC 619:577.484:576.858.4

Relationship Among Heterogenic Strains of Hoof and Mouth Disease Viruses

18400398 Moscow VETERINARIYA in Russian No 3, Mar 88 pp 33-35

[Article by A.A. Boyko and B.A. Kruglikov, All Union Scientific Research Institute of TIBP (not further defined), Main Administration of Veterinary Medicine, USSR State Agricultural Industry]

[Abstract] Survival of animals infected by one type of hoof and mouth disease pathogens does not exclude the possibility of another infection with another type of pathogen; this points out the differences in antigenic structures of such pathogens. One of the principal reasons for disease outbreak is the increase in the host population—the highly susceptible cattle. Hoof and mouth disease infections could also result from multiple agents. Laboratory experiments were carried out studying competitive reactions between hoof and mouth disease virus isolates type O_1 and A_{22} using weanling mice. It was shown that after inoculation with both viruses, their reproduction was not the same; after repeated passages O_1 virus eliminated the A_{22} strain. This phenomenon has also been observed in other studies, indicating that type O_1 virus is more competitive and is able to reproduce in many types of susceptible animals. These effects are expressed even more drastically under conditions of massive commercial cattle breeding.

07813/06662

UDC 615.281.8.03:[616.98:578.828]-092:612.017.1-064]-021.5].012.6

Search for Preparations Suppressing Reproduction of AIDS Virus

18400342b Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 25 Jul 86) pp 34-37

[Article by D.N. Nosik, M.N. Korneyeva, N.S. Korsun, S.N. Mayorova, O.V. Parshina, A.I. Gromyko, F.I. Yershov and V.M. Zhdanov (deceased), Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Extensive data on the antiviral activity of interferon, its inducers and some immunostimulators make these agents prime candidates for testing their activity against the AIDS virus, representing the first step in development of rational etiotropic therapy for AIDS. Domestically produced interferon inducers, thymus gland hormones and human recombinant α_2-interferon (reaferon) were studied on transplanted human lymphoblastoid cell line H9/IIIB. It was shown that at the doses used, reaferon showed no antiproliferative activity on the cell line but affected expression of viral antigen. At 10 IU/ml some replication depression was seen and at 100 IU/ml viral replication was stopped. No effect was noted with interferon inducers alone, but in combination with DEAE-dextran, a toxic effect was seen. Immunomodulators stimulated cell proliferation and lowered the amount of virus-specific antigen (the 5th fraction of thymosin showed the greatest effect). It was concluded that preparations with different antiviral mechanisms of action should be evaluated in the future. References 9: 3 Russian, 6 Western.

7813/12232

UDC 616.98:578.828]-092:612.017.1-064]-07:616.153.962.4-097-078.73

Immunodiagnosis of AIDS Using Preparations of Recombinant Antigen of HTLV-III Virus Surface Protein

18400342c Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 19 Mar 87) pp 37-44

[Article by A.A. Kovgan, A.N. Poltorak, V.A. Pasechnik and V.M. Zhdanov (deceased), Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] In previous work a hybrid plasmid was obtained coding thermally induced synthesis of the HTLV-III viral antigen with molecular weight of 90 kD. The goal of this work was to develop a method for purification of the recombinant HTLV-III surface protein antigen from E. coli cells and to develop an immunodiagnostic test for AIDS using these purified preparations. The antigen was purified by fractionation of bacterial lysates with preparative isoelectric focusing in a granulated gel layer or preparative polyacrylamide gel electrophoresis in a Multiphore apparatus. Three env-specific polypeptides with molecular weights of 20, 24 and 30 kD were obtained, which were used to develop a solid phase enzyme immunoassay using nitrocellulose filters (direct method) or a polystyrene sandwich (competitive method). Positive results were obtained when five different sera from AIDS patients were tested with this method. Figures 4; references 17: 4 Russian, 13 Western.

7813/12232

UDC 615.281.8.012.6

Antiviral Factors Isolated from Infected Cell Cultures

18400342d Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 22 Jul 86) pp 63-66

[Article by V.I. Votyakov, N.V. Gribkova, M.Ye. Khmara, K.V. Moshchik, N.M. Iyevleva, L.A. Lyakh, V.L. Kolodkina, L.S. Blinova and Z.M. Grigoryeva Belorussian Scientific Research Institute of Epidemiology and Microbiology, Minsk]

[Abstract] Experimental data were reported characterizing the dynamics of accumulation, spectrum of antiviral activity and some physicochemical properties of an antiviral factor (AF) isolated from cell cultures infected with Venezuelan equine encephalomyelitis (VEE) virus. AF was prepared by a method described in a previous publication. The highest activity was observed in AF obtained from infected chick embryo fibroblasts. AF showed remarkable stability at different pH values or when heated to 100°C for 30 min, but lost its activity after a 60 min incubation with trypsin at 30°C. AF inhibited reproduction of VEE, herpes, vaccinia, vesicular stomatisis and fowl plague viruses. The antiviral activity of AF was not accompanied by depression of cell metabolism; synthesis of cellular RNA and proteins was even somewhat stimulated. Figures 2; references 17: 4 Russian, 13 Western (1 by Russian authors).

7813/12232

UDC 578.245.2:578.76/:519.24

Mathematical Modelling of Interferon Inducer Effects in Development of Viral Infection

18400342i Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 25 Nov 86) pp 94-98

[Article by N.P. Chizhov, and Ye.V. Churnosov, Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] Several mathematical models exist for regulation of immune response in infectious diseases. These

models were shown to be applicable to studies of pharmaceuticals. The goal of this theoretical work was to develop a mathematical model for the use of interferon inducers on the background of a developing viral infection. The model consists of seven common differential equations describing the dynamics of host-parasite interactions. It contains expressions for: concentration of virus, number of plasma cells, specific protection factor, nonspecific protection factor, intracellular interferon, general state of the organism, average inducer concentration and dose of the inducer. This model was shown to be adequate for the proposed application: to describe the development of specific and nonspecific elements of the immune system, which was illustrated with single and multiple use of inducers. Optimal dose ranges were shown to exist along with optimal introduction times of the inducer. The threshold level for the inducer was identified and the role of the inducer in subthreshold situations is discussed. This model could be used in chemotherapeutic studies but it should be coupled with animal experiments. Figures 4; references: 6 (Russian).

7813/12232

UDC 578.833.26.086.3

Electron Microscopic Study of Lassa Virus

18400342f Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 15 Dec 86) pp 75-81

[Article by Yu.G. Ilkevich, N.N. Lemeshko, R.F. Maryankova, I.S. Lukashevich and S.M. Klimenko, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Belorussian Scientific Research Institute of Epidemiology and Microbiology, BSSR Ministry of Health, Minsk]

[Abstract] The pathogen of Lassa fever is Lassa virus, one of the most pathogenic and contagious agents from the arenaviridae family. The goal of this work was to investigate viral paricles purified in isodensity gradients and to study viral morphogenesis in a Vero cell culture. The use of γ-radiation for inactivation did not alter the structure of virions, enabling their examination with an electron microscope using negative staining. The pathogenic strain did not show any differences from other nonpathogenic members of this family; atypical virions were sometimes visible alongside typical particles containing ribosome-like granules in ultrathin sections. Of greatest interest were particles with a heterogenous core in which sandy granules could be distinguished, resembling typical virions of arenaviruses. The higher than usual quantity of uranophilic material within the viral particle could have resulted from injection of genetic material into virions during their formation. Figures 3; references 18: 3 Russian, 15 Western (2 by Russian authors)

7813/12232

UDC 578.821.083.12

Pox Virus Isolation (Poxviridae, Orthopox Virus, Cowpox Complex) From Root Voles (Microtus oeconomus Pal. 1776) in Forest-Tundra of Kolsky Peninsula

18400342h Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 10 Feb 87) pp 92-94

[Article by S.D. Lvov, V.L. Gromashevskiy, S.S. Marennikova, G.V. Bogoyavlevskiy, F.N. Bayluk, A.M. Butenko, Ye.N. Gushchina, E.M. Shelunkhina, D.A. Zhukova and T.N. Morozova, Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR Academy of Medical Sciences; Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences; Institute of Viral Preparations, USSR Ministry of Health, Moscow]

[Abstract] During the period of June-July 1985, 225 rodents were captured in the forest-tundra of Kolsky Peninsula. Pooled organs from each group were analyzed for viral activity. From one such pool of root vole organs, the LEIV-11411 Mur-Lovozero viral strain was isolated. Electron microscopic study showed that it belonged to the Poxviridae family. Its pathogenicity was similar to that of the rat virus. It was different from vaccinia and ectromelia viruses but resembled the cowpox virus and its biovariants isolated from white rat and wild rodents in Turkmenia. Figure 1; references 6: 1 Russian, 5 Western (3 by Russian authors).

7813/12232

UDC 615.281.8,03:[616.98:578.833.1].076.7

Effect of Remantadine on Morphogenesis of Venezuelan Equine Encephalomyelitis

18400342g Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 25 Jun 86) pp 81-86

[Article by L. G. Bakanidze and N. A. Leontyeva, Georgian Antiplague Station, USSR Ministry of Health, Tbilisi; Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Compounds such as amantadine and remantadine show moderate in vitro activity against areno-, rabdo-, and alpha-viruses. Evidently they have similar deproteinization mechanisms. Results of electron microscopic studies of Venezuelan equine encephalomyelitis (VEE) virus obtained in the presence and absence of remantadine were reported in this paper. Under the experimental conditions studied, structures were observed which are associated with viral reproduction in the cytoplasm of cells treated with remantadine, but neither cores nor adult viral particles were seen. It is

possible that remantadine affects late stages of VEE virus morphogenesis such as formation of viral cores. Figures 5; references 14: 4 Russian, 10 Western (1 by Russian authors).

7813/12232

UDC 578.833.26:578.74].083.3

Preparative Separation of Antigenic Structures of Tick-Borne Encephalitis Virus

18400342j Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 2 Dec 86) pp 98-102

[Article by V.V. Lyapustin, G.G. Karganova, S.G. Sobolev and T.S. Gritsun, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] During reproduction of tick-borne encephalitis (TE) virus, virion (VA) and non-virion (NA) antigens are synthesized with different immunological properties. Several methods exist for obtaining VA and NA but none are capable of yielding VA-free NA preparations. An attempt was made to achieve this separation by a preparative technique based on barrier electrophoresis on agarose gel with a high index of electroendoosmosis and Swendsen buffer. This method produced virtually purified VA in cathode chambers and NA free of VA admixtures in anodic chambers. These agents, free of each other, could now be used to prepare highly specific antisera for further studies of the immunologic properties of VA and NA and analysis of antigenic preparations of TE virus. Figures 2; references 17: 12 Russian (2 by Western authors), 5 Western

7813/12232 .

616.98:578.833.28]-078.73

Effectiveness of Tissue Culture Antigens in Serodiagnosis of Hemorrhagic Fever with Renal Syndrome By Immunofluorescence Method

18400342e Moscow VOPROSY VIRUSOLOGII in Russian Vol 33, No 1, Jan-Feb 88 (manuscript received 20 Jan 87) pp 71-75

[Article by T. K. Dzagurova, Ye. A. Tkachenko, and V. A. Petrov, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] Hemorrhagic fever with renal syndrome (HFRS) is one of the most widely spread natural foci infections in the USSR, Southeast Asia and Africa. Not until 1978 was a specific antigen for HFRS identified and an immunofluorescence assay (IFA) developed. Until 1983 wild rodents were the only source of this antigen, since attempts to cultivate it were unsuccessful. In 1983 the HFRS virus began to be cultivated in Vero-EG cells. The effectiveness of IFA in serological diagnosis of this infection was evaluated. The use of cell culture-derived antigens enhanced the sensitivity and specificity of this assay. This method could be used to support doubtful clinical diagnoses of HFRS and even to detect cases when clinically no HFRS could be suspected. The IgM antibodies were masked by the IgG fraction; therefore, this IFA was not effective in early serological diagnosis of this infection. References 8: 5 Russian, 3 Western.

7813

UDC 615.849.19.03:061.3(47+57 "1987"

First All Union Conference on Application of Semiconductor Lasers and Photodiodes in Medicine

18400384 Moscow KLINICHESKAYA MEDITSINA in Russian Vol 66, No 3, Mar 88 (manuscript received 22 May 87) pp 152-153

[Article by B. S. Briskin and A. A. Nosov, Moscow]

[Abstract] The conference was held in April 1987 in Kaluga, at the Scientific Technological Center of Information; it was organized by the Commission on the Application of Laser Methods in Diagnosis and Therapy, USSR Academy of Medical Sciences. A. K. Polonskiy covered the topic of "The Prospects of the use of semiconductor lasers and photodiodes in medicine" informing the plenum that the production of domestic laser and magnetolaser equipment is under way whereas none are being made abroad, as yet. The utilization is still experimental, the work is not well coordinated and only some experts are involved in it. There is need for training facilities to educate technical staff in its use before this equipment becomes widely used. V. I. Shveykin pointed out the need for cooperation between medical and technical cadres in development of this technology. A. R. Yevstigneyev discussed basic principles of biophotometry. Several models of these laser units were on display. Clinical application of this technology was the second topic at this conference. B. S. Briskin discussed treatment of inflammatory states and wounds, V. G. Dobkin reported on treatment of tuberculosis patients, M. T. Aleksandrov addressed dosimetry in maxillofacial surgery, I. M. Korochkina reported her group's experience in using laser therapy in ischemic heart disease and in duodenal ulcers and V. I. Kozlov discussed magnetolaser therapy of the eye. Veterinary application of lasers was addressed by Ye. M. Andreyev.

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